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CONTENTS

	PAGE
Editorials	473
Letters to the Editor	478
The Scrap Heap	479
Overseas Railway Affairs	480
Locomotives of the Future	481
Preserving Metal Work in Railway Bridges	482
Lord Leathers	486
Railway News Section	487
Personal	487
Transport Services and the War	489
Stock Market and Table	496

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list which will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

REDUCTION IN SIZE OF PAGE

To economise in paper our readers will observe a slight reduction in the size of THE RAILWAY GAZETTE *in that the size of the page has been reduced from 9 in. × 12 in. to 8½ in. × 11½ in. The type area of the page remains the same, namely, 7 in. × 10 in., but the surrounding margins have been reduced. This of course detracts from the appearance of the paper, but is one of the exigencies of the war*

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 5.30 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Mr. Morrison on Private Enterprise

MR. HERBERT MORRISON seems determined to keep the State *versus* private control controversy well to the fore in the minds of the public. His latest pronouncement on the subject was made to the Regional Labour Party Conference at Birmingham on Saturday last, and does nothing towards bringing nearer the settlement of a purely political question. Mr. Morrison went so far as to say that in his judgment the real post-war issue was that of the relation between the State and industry. After the war, over a considerable part of the economic field there would not be genuine private enterprise in the old sense—or any prospect of it. The issue would be whether centrally organised industries should be allowed to run their own affairs in their own separate way on the basis of restriction, monopoly, and safety first, or whether the State would find means, by public ownership or by some form of public control, to ensure that they were operated in the interests of expanding national wealth and a policy of full employment. So far as the railways are concerned, Mr. Morrison might do well to consider some of the facts given in our March 26 issue, where it was shown that the companies had spent some £260,000,000 in the eleven years to 1938 on maintaining railway efficiency at a level which has begun to be appreciated since the outbreak of war. This money had been spent at the expense of dividends to stockholders, and in the ultimate national interest.

U.S.A. Tributes to British Railways

Some well-deserved tributes to the railways have appeared in letters published in *The Times* recently. On April 30, Mr. J. B. Young wrote of the railway companies and "the wonderful efficient service they continue to afford the public after nearly four years of war conditions." He thought that no praise was too high for all concerned, from the fitter to the engine driver, not forgetting the "lady" porter. Mr. Melville P. Troy, in a letter which was published on May 5, recorded the comments of an American railway executive during a recent visit to this country. Speaking as one American to another, he said to Mr. Troy:—"What has struck me most as a railroad man during my stay over here has been the vital strategic part played by the railways. I have seen a number of the top men over here and have been struck by the very high degree of skill and efficiency which has enabled them to handle what is virtually double their peacetime traffic load. The way they have switched over from peacetime operating to the tremendous strain of war transport, often under continuous aerial bombardment, is an achievement that no other railroad management in the world could equal."

Canadian Pacific Railway Fixed Charges

Mr. D. C. Coleman, President of the Canadian Pacific Railway Company, dealt at some length with the dividend policy of his board at the annual meeting on May 5, a report of which appears on page 492. He stressed that fixed charges had been reduced by nearly $2,500,000 below the peak reached in 1940 to $23,000,000 but they were still considerably above the pre-depression level. There would be a further reduction during the present year, and when results become available the question of the dividend payment would again be reviewed. The fact that the ordinary stockholders had had no return on their investments since 1932 had not been overlooked, but funds had to be provided for maturing obligations and essential capital improvements. Moreover, the company was faced with the unpredictable financial requirements of the post-war period, and in any event a prudent policy would be to follow a conservative course when determining any dividend which might be declared. Gross earnings in the first quarter of the present year had increased by $5,600,000 or 9·8 per cent. over the like period of 1942, but working expenses had risen by $6,900,000 or 14·6 per cent., so that the net earnings of $8,700,000 were lower by $1,300,000.

Tube Shelter Cost: Estimate and Reality

As long ago as November 3, 1940, Mr. Herbert Morrison, the Minister of Home Security, outlined the Government's policy on the subject of deep air raid shelter, and the extension, by tunnelling, of the deep shelter provided by tube stations in London. The original idea was that short radial tubes should be built from 10 existing stations with the sole object of providing deep level shelter for about 100,000 persons. These were estimated to cost approximately £1,500,000, or £15 a person. In making more detailed plans, however, the Ministry of Home Security had the advantage of the advice of the London Passenger Transport Board, and eventually it was decided that the new tube sections should be parallel with the existing running

lines, and that shelter should be provided for fewer persons. The cost of the work, which was then estimated at about £1,333,000, was to be borne by the Exchequer, like that of any other public shelter. The average of £15 a head was not modified, and thus showed this form of shelter to be very expensive, as it compared with a normal figure of £4 a head for public shelter. Eventually, work was undertaken with 8 shelters, intended to accommodate about 67,000 persons, and it has now been announced officially that the cost has risen to £2,811,000, or about £42 a head. The discrepancy between estimated and actual cost, even in war conditions, is noteworthy.

Overseas Railway Traffics

A moderate demand still prevails for Argentine railway debenture stocks based on a continuance of traffic increases and the improved Argentine exchange position, although there is no indication of the Government being willing to allow the railway companies a more favourable rate. In the 43rd and 44th weeks of the financial year, the advances in traffic receipts have been on a more moderate scale than in the previous fortnight, except on the Buenos Ayres Western, which has a net gain of £16,680. Central Argentine receipts in the two weeks are up £46,716, the Buenos Ayres & Pacific has an advance of £23,700, and the Buenos Ayres Great Southern one of £7,080. Small net advances of £830 and £552 respectively are shown by the Argentine North Eastern and the Entre Rios. The Great Western of Brazil for the period January 1 to May 1, 1943, has traffic receipts of £281,200, an increase of £92,500, and the Leopoldina for the same period, with an aggregate of £564,327, shows an advance of £40,777.

	No. of week	Weekly traffics	Inc. or decrease	Aggregate traffic	Inc. or decrease
		£	£	£	£
Buenos Ayres & Pacific ...	*44th	110,100	+9,900	4,402,140	+574,080
Buenos Ayres Great Southern	*44th	148,020	+6,480	7,101,600	+647,700
Buenos Ayres Western ...	*44th	60,660	+17,100	2,377,740	+130,680
Central Argentine	*44th	120,912	+17,862	5,820,951	+1,198,128
Canadian Pacific	17th	1,591,000	+223,600	17,465,800	+1,812,400

* Pesos converted at 16⅔ to £

Traffic receipts of the Nitrate Railways for the period January 1 to April 30, 1943, amount to £50,015, an improvement of £2,929, and the Antofagasta aggregate to May 2 is £474,020, an increase of £96,620.

Argentine State Railways

The Argentine State Railways have a total mileage of approximately 7,776, and is thus now the largest individual system in Argentina. Of the major British-owned lines, the Buenos Ayres Great Southern Railway has 5,080 miles, the Central Argentine 3,700 miles, the Buenos Ayres & Pacific 2,807 miles, and the Buenos Ayres Western 1,930 miles open. The principal system of the State organisation is the Argentine Central Northern, metre-gauge line, which has lines running from Buenos Aires through Tucuman to the Bolivian border, and from Santa Fe into the Provinces of San Juan, Mendoza, La Rioja, and Catamarca. A Government 4 ft. 8½ in.-gauge line on the east side of the Parana river, connects with the Entre Rios and Argentine North-Eastern Railways. The Argentine State Railways also include a considerable mileage of 5 ft. 6 in. line in Patagonia, which links up with the Buenos Ayres Great Southern Railway, and extends towards the Chilean border. The system has 983 locomotives, 812 carriages, 18,118 wagons, and 105 rail cars.

Emergency Transport Co-operation

There have been many outstanding examples of co-operation between road and rail in emergency conditions which perforce have remained unrecorded for security reasons, but, with the passage of time, some may now be revealed. One such instance occurred in the Liverpool area about two years ago when, as a result of enemy action, severe damage was caused to the L.M.S.R. railway line running into Liverpool (Exchange) Station. For a considerable period it was impossible to provide railway facilities between Liverpool and places on the electric lines to Southport and Ormskirk, but, through close co-operation between the L.M.S.R. and road operators, supported by the efforts of the North-Western Regional Transport Commissioner, communications were maintained by the institution of road services from the city linking up with the rail services at stations beyond the point where the line was broken. Some 70 operators participated in the operation, and as many as 50 road vehicles a day were operated on railway behalf in the initial stages of the dislocation. Vehicles and drivers were provided by the Liverpool, Southport, and Wallasey Corporations, Ribble Motor Services Limited, and Crosville Motor Services Limited, and also by large numbers of coach operators from Lancashire and Cheshire. L.M.S.R. staff acted as conductors on the buses for collecting railway tickets covering the combined rail and road journey. At the beginning, some 30,000 persons were conveyed every day. The organisation of the road services was undertaken at the request of the Regional Transport Commissioner by the Liverpool Corporation Transport Department.

A Wartime Train Working

As was briefly recorded in our last week's issue, the longest train ever worked on a regular schedule on the Southern Railway, left Waterloo, on May 4, on the 10.50 a.m. West of England service. For the duration of the war it is planned to run the train on Tuesdays, Wednesdays, and Thursdays. The train is made up of 16 coaches and weighed 513 tons on the down journey to Salisbury, and 519 tons on the upward run. The length of the train is approximately 1,000 ft., and, therefore, it extends over the limits of most station platforms. The train is worked by locomotives of the "Merchant Navy" class, and has indeed been made possible only by the additional power provided the company by these engines. The purpose of the innovation is to save fuel, engine-power, and man-power, and for these reasons the inconvenience arising from the use of a train of these dimensions is not only justifiable in wartime, but commendable.

Preserving Metal Work in Railway Bridges

One of the chief problems in railway bridge maintenance is that of corrosion of the metalwork, and it is gratifying to note that the Southern Railway has made some experiments in the construction of steel bridges having a protective covering of concrete, with a distinct promise of complete success. In the article on page 482. Mr. S. G. Morgan, M.Inst.C.E., gives details of cases where the steel structure of certain bridges has been so protected, and he goes on to show that in addition to the advantages of the construction against loss due to corrosion, the extra dead weight gives more stiffness under impact and, to a small extent, adds to the stability of the abutment. The illustrations show that the appearance of a bridge can be æsthetically treated by the use of simple form-work, producing attractive elevations combined with a suggestion of strength. The covering of the steel in railway bridges is not favoured by some railway engineers, however, and there are many who prefer the exposed type of bridge, as it is considered that the steel should be easily available for inspection and repair if necessary. On the other hand, the sponsors of the concrete covering tell us that maintenance of protected structures will be almost negligible. The idea of combining the strength of a steel member and a concrete cover has been exploited for many years in building work, and bridge designers will be interested in the future behaviour of the structures described in the article.

Decline of Goods Traffic in France

A steady decline in the tonnage of goods handled has been taking place on the French railways since the fall of that country in 1940. As was stated in our June 12, 1942, issue, the daily average of wagonloadings on the French National Railways amounted in 1939 to 34,226, whereas in 1940 it had declined to 28,802, and, in 1941, to 28,700; information received since indicates a further drop to 25,200 in respect of last year. Some of the factors affecting this decline are the increasing difficulties of obtaining supplies, particularly of coal and lubricants; the depletion of locomotive and rolling stock by transfer to other German-controlled territories; and the destruction wrought by the Royal Air Force on transport targets. On the other hand, a great deal must be attributed to the fall in production caused by lack of materials, and by the closing-down of various works, either concentrated production, or as the result of equipment having been transferred to Germany; about 10,000 works in France are said so far to have been closed. The railways are suffering also from acts of sabotage, in spite of a recent announcement that German rolling stock so destroyed must be replaced by the French. A serious position is said to be developing in the supply and distribution of food.

American Locomotive Building in 1942

Locomotive building in the United States showed a great increase in 1942 over 1941 and 1940; the respective totals built by outside contractors were 1,602, 970, and 587. By far the largest increase from 1941 to 1942 was in steam locomotives, which totalled 182 and 715 in these two years; diesel-electric locomotives increased from 712 to 787, electrics from 18 to 22, and other types from 58 to 78. In addition to the above, the railway shops were responsible for turning out 64 steam and 18 electric locomotives in 1942, as compared with 20 and 4 in 1941, so that the aggregate increase from 1941 to 1942 was from 994 to 1,684. At the end of 1942 the outside

builders had on their books uncompleted orders for 1,139 steam, 781 diesel-electric, 43 electric, and 4 other locomotives, a total of 1,967, and the railway shops had on order 105 locomotives, 92 steam and 13 electric, making an aggregate outstanding of 2,072 locomotives. If the outstanding orders were completed during 1943, in the years 1941, 1942, and 1943 the total steam locomotives built would be 202, 779, and 1,231 respectively, and the total diesel 712, 787, and 781. Many of the steam locomotives, however, are intended for service overseas. Thus, of the 1,684 locomotives built in 1942, only 712 went into service on Class 1 American railways; yet even this was a larger number than in any year since 1930.

The Pullman Anti-Trust Suit

Closing arguments have been given before the Third Circuit Court of Appeals in Philadelphia in the anti-trust suit which, as set out in an editorial article at page 293 of our February 27, 1942 issue, has been brought against the Pullman Company by the United States Government. The basis of the argument was that Pullman had cornered the market in the building and operation of luxury vehicles, and that thereby other competitors in the car-building business were being excluded, in particular the firm of Budd, which has largely pioneered in the building of streamlined stainless steel stock. The Government argument was that the suit was part of a general programme to "free transportation" in the future, so that it would be in a position to face competition. To most of the Government arguments the Pullman advocates had an adequate answer. They pointed out that the whole matter turned on the fact that Pullman had been willing, throughout its history, not merely to build cars, but also to service them. The Pullman Company, so far from being a monopoly, was entirely dependent on the railways for its existence, and no railroad nor any member of the public had been induced to appear before the court to claim that Pullman operations were doing any injury either to railway or public interests. Furthermore, luxury cars, with their service, formed only one-sixth of the total of American passenger cars, and the remaining five-sixths, in which no service was required, were a completely open market from the building point of view.

Operating Difficulties in Belgium

Operating conditions on the Belgian railways have been rendered increasingly difficult during recent months by the continued requisition of rolling stock by the occupation authorities. The number of goods wagons available to civilian consignors has been decreasing steadily: official figures show that the daily average number of wagons for this purpose was 8,078 in October, 1942; 7,769 in the next month; and 6,209 in December. The greatest reduction was in the daily number of open (particularly coal) wagons, which amounted to 5,388 in November, compared with 3,992 in December. Transport on inland waterways has been suffering in the same way through the requisitioning of vessels, and the Belgian National Railways are co-operating closely with water-transport services in an effort to alleviate the common difficulty. It is stated that endeavours have been made also to increase road services in certain districts. There has been a considerable reduction in the number of train-km. run by the Belgian National Railways compared with the period preceding the war. Average passenger train-km. a day during December, 1942, totalled approximately 73,000, against 76,000 in December, 1939, and 159,000 in the same month of 1938. Comparative (weekday) figures for goods train-km. were 49,000; 55,000; and 71,000 respectively. The peacetime figures exclude those for the Nord-Belge system; those for the war period include German military traffic.

Block Working on the Cairn Valley Line

The closing of the Cairn Valley line of the L.M.S.R. to passenger traffic, referred to editorially in our issue of April 30, recalls that this was the first single line of any length in this country to be worked by lock-and-block instead of by a token system. There had been one or two sections brought into service on the G.W.R., we believe, before the Cairn Valley installation, and these, we understand, are still in use. The Cairn Valley was a complete branch line installation and was further distinguished by having the signals electrically worked and normally directly controlled by the slide handles of the block instruments. The operation of single lines by lock-and-block only did not find favour in Great Britain and, strictly, did not conform to official requirements, without special sanction being given, until recent years. A few other examples of it were, however, allowed to be brought into use. Of late years the operation of single line sections by track circuit locking and some form of traffic direction control has been used satisfactorily, but it would probably be difficult to justify the expenditure needed for it on many sections, at least at present.

South Australian Government Railways

THE report of the South Australian Railways Commissioner for the year ended June 30, 1942, shows that gross earnings for the period, amounting to £4,963,907, an increase of £1,433,741 over the preceding financial year, were greater than for any previous year. This was due largely to the continued growth of passenger traffic, and to a substantial increase in general merchandise traffic, caused by industrial expansion, restrictions on interstate shipping, petrol rationing, and defence activities; there was, however, a decrease from the carriage of wheat. Working expenses rose, compared with 1940-41, by £796,917 to £3,753,930: of this increase, various wage awards (some of which operated only for a portion of the financial year) accounted for £194,754, and the higher cost of coal for £41,729. The new payroll tax increased costs by £51,540; payment also has been made for deferred leave amounting to £50,453. With the increase in net earnings to £1,209,977 (compared with £573,153 in 1940-41), after accounting for interest, depreciation (£120,000), sinking fund, and exchange, the deficit was reduced, by £637,487, to £134,948. The general results are compared in the following summary:—

	1940-41	1941-42
Miles open	2,557½	2,557½
Train-miles	5,892,240	6,598,746
Passenger journeys	20,360,011	28,512,513
Goods, minerals and livestock (tons)	2,770,374	3,127,900
Average haul (miles)	119·4	123·4
Operating ratio (per cent.)	83·8	75·6
	£	£
Capital cost of open lines	28,920,290	29,271,009
Gross earnings	3,530,166	4,963,907
Working expenses, including pensions	2,957,013	3,753,930
Net earnings	573,153	1,209,977
Interest, sinking fund, depreciation, etc.	1,345,588	1,344,925
Total deficit	772,435	134,948

The increase in passenger traffic was common both to country and suburban travel. The number of passengers in the former category increased from 1,718,046 in 1940-41 to 2,638,860 in 1941-42, and that in the latter from 18,641,965 to 25,873,653; country passenger receipts increased from £552,359 to £904,475, and suburban passenger receipts from £269,411 to £405,248. The tonnage of merchandise carried showed an advance under all heads, except that of wheat, which declined from 571,221 tons in 1940-41 to 356,690 tons in 1941-42. The tonnage of general merchandise conveyed rose from 1,254,590 to 1,758,656; of wool, from 39,421 to 41,026; of livestock, from 185,497 to 211,830; and of minerals, from 691,341 to 732,076. The tonnage of freight carried by road showed a decrease, and amounted to 27,622, compared with 28,304 for the preceding financial year. Bookstall and refreshment services brought in a total of £211,535, against £142,804 for 1940-41. The Government contribution of £120,000 to be applied towards paying 20 per cent. of the prescribed freight charges on the carriage by rail of wool, manures, livestock, wheat, flour (from country mills for metropolitan area), and barley continued throughout the period under review, railway customers receiving the benefit of such reduction on the ordinary freight rates. The total value of this concession amounted to £127,183 for the year, or £7,183 more than the fixed government contribution.

New Zealand Government Railways

DURING the financial year ended March 31, 1942, more business was handled by the New Zealand Government Railways than in any previous year in the history of the Dominion. As was briefly recorded in our January 8 issue, gross revenue reached a new high level of £11,938,338, exceeding by £778,120 the previous record figure established in 1940-41. Expenditure amounted to £10,056,034, compared with £9,465,574 for the previous financial period; and the net revenue was £1,882,304 (against £1,694,644). On a percentage basis, the net return on capital was 2·90 per cent., compared with 2·64 per cent. in 1940-41, and 1·96 per cent. in 1939-40. Interest charges at 4¼ per cent. amounted to £2,756,146, leaving £873,842 excess of interest charges over net revenue, against £1,051,900 at the end of the previous year. Both earnings and expenditure were affected by war conditions. Revenue benefited by the diversion of road traffic to the railways, due to petrol restrictions; shipping difficulties; and the Government's policy of co-ordinating rail and road transport; it was augmented also by the carriage of military personnel and of war supplies. Expenditure was higher by reason of a rise in maintenance and transport expenses necessitated by the increased volume of traffic handled, and of the payment to staff in the lower grades of the

cost-of-living bonus for a full year, as against only seven months in the previous year. The subsidiary services operated by the administration, which include Lake Wakatipu steamers, refreshment, bookstall, and advertising services, buildings, and road motor services, produced a gross revenue of £1,554,458, compared with £1,466,028 in 1940-41. The figures in the accompanying table refer to railway operations only:—

	1940-41	1941-42
Miles open	3,390	3,390
Train-miles	13,559,646	13,978,961
Passengers, ordinary	9,440,087	11,105,627
Goods and livestock tonnage	8,426,182	8,473,765
Operating ratio, per cent.	86·72	85·73
	£	£
Passenger receipts	2,345,718	2,658,778
Goods traffic receipts	6,818,603	7,174,060
Operating earnings	9,694,190	10,383,880
Operating expenses	8,406,790	8,902,592
Net earnings	1,287,400	1,481,288

Receipts from the conveyance of goods and livestock, and the tonnage of goods carried, were the highest ever recorded in the history of the system. The increase in freight revenue was reflected in the majority of classes of merchandise traffic; the principal advances were in respect of livestock (£44,762); coal (£49,997); frozen meat (£48,556); and general merchandise (£230,950); the last-named traffic, as stated above, benefited by the carriage of large quantities of military stores. The operation of road motor services accounted for a net revenue of £42,730, compared with £31,846 in 1940-41. The average number of staff employed during the period under review was 23,352, against an average of 24,502 for the previous financial year.

Braking Problems on High-Speed Trains

AFTER the war, when the depressing (but inevitable) decelerations in express train running can be swept away, there will undoubtedly be a larger demand than ever before for high-speed rail connections between the principal cities in this country, and the railways will at last be in a position to forge further links in the remarkable chain of progress in high-speed running which was created during the years 1932-38. Among the various problems of engineering design which such a development will bring into prominence, efficient braking is one of the most important, and one which still offers considerable scope for practical research. The view is held in some quarters that, in order to be able to deal with any emergency, a retardation higher than any yet known in railway braking practice may be desirable in the interests of safety. A retardation of more than $\frac{1}{2}g$, or 13 m.p.h. per sec. has been attained with Michelin pneumatic-tyred railcars. In these instances the retarding force is equal to the weight being braked, and, of course, is able to reach such a magnitude only by virtue of the employment of rubber tyres on steel rails. Such retardations, however, are not unattended by some degree of discomfort to the passenger.

For steel-tyred wheels on dry, unsanded, steel rails, the ratio of the braking force to the load on the wheel is not likely to exceed 0·25, if that figure represents the coefficient of friction between the rail and the wheel. Adverse conditions may reduce this coefficient to 0·18-0·20. The corresponding practicable rates of retardation would be 5·5 m.p.h. per sec. for the most favourable conditions, and about 3·5 m.p.h. per sec. for unfavourable conditions. The former retardation would cause a train travelling at 100 m.p.h. to be stopped in 1,350 ft., and the latter in 2,225 ft., which would approximate to the sort of emergency stop likely to be made under service conditions. Thus it will be seen that there is a considerable scope for improvement in this direction. The distance in which the train can be brought to rest can be much reduced by the application of sand, and it will be interesting to see if an effort will be made to adopt more generally some automatic device for linking the sanding gear to the brake application handle, to bring the former into action when the brake handle is in the emergency position.

A major problem confronting the engineer is the method of disposing of the heat generated in braking. In view of high maintenance costs, brake drums which were tried on some high-speed lightweight trains have been discarded in favour of disc brakes. New forms of brake shoes have also been tried, and attempts have also been made to solve the problem by employing two brake blocks. The clasp brake, with blocks acting on the tyres, would still appear to be one of the most satisfactory types evolved so far. It will be appreciated that, for a given train, it is far less gruelling for the brake blocks when a short sharp application is made to stop the train than when a gentler but long-continued pressure is applied to the blocks to control the speed on a lengthy down-grade, since in the latter case the heat to be dissipated is generally much greater, and may even damage the tyres.

With an axle loading of 18 tons, a train travelling at 100 m.p.h., if stopped in 1,225 ft. would necessitate the dissipation of energy having an instantaneous maximum of 2,000 h.p. per axle. One of the complicating factors in calculations pertaining to braking from high speeds is the variation in coefficient of friction, which makes the actual rate of dissipation of energy a continually changing quantity. In practice, too, engineers find it necessary frequently to relieve engine brake-block pressure in order to prevent damage to the tyres through overheating.

Tests carried out at the University of Illinois Engineering Experiment Station* have been of particular value in establishing the fact that a comparatively low brake-block pressure (1,000 lb.) gives better results—in wear per 100,000,000 ft.-lb. of energy absorbed—than higher pressures (over 2,000 lb.). Difficulties arose through the departure from circularity of the wheel tread, due to the heat absorbed. High brake-block pressure caused the material of which the blocks were composed to be deposited on the tyre; and pressures of 2,000-3,000 lb. gave rise to small cracks on the tread. One of the most urgently needed investigations in this province is an accurate assessment of the temperature at the surface of the braked wheel; the nearest points, at which thermocouple readings have so far been recorded, are $\frac{1}{8}$ in. below the centre of the tread, where the observed temperature was 280 deg. F. for a pressure of 1,000 lb., and 690 deg. F. for a pressure of 3,000 lb. Until the whole range of factors entering into the problem has been methodically investigated, and the results made available to designers, further progress is likely to be slow and haphazard. It is by no means evident that the maximum practicable retardation for the actual operation of steel-tyred railway vehicles has yet been attained. For the work that remains to be done, the spirit of the patient and painstaking trials recorded by Galton†—the most notable and accurate of their kind ever made—might well serve as an inspiration to those who may be able in future to assist in the inauguration of a new era of railway speed by (paradoxically) perfecting new or improved means for bringing trains to rest.

Alternative Routes

IT is well known that no other country has such a density of rail communications as is provided by the British railways. Events have proved that, from a purely commercial point of view, the spate of railway construction which occurred during what historians have appropriately named the "railway era" proceeded beyond the bounds of prudence. The result was that in numerous instances there were two or more alternative routes between important centres of industry which, under the pre-amalgamation conditions, gave rise to uneconomic competition between the owning companies concerned. The amalgamation of the British railways into four groups did away with much of this wasteful competition and enabled a degree of co-ordination to be effected.

From a strictly operating point of view, however, the availability of alternative routes has many advantages and the unequalled network of communications provided by the British railways has proved of the greatest value during the present world war. The unprecedented volume of freight traffic now passing has thrown a great strain on the main trunk lines and it has been found necessary to make regular use of alternative routes to afford the necessary relief and avoid congestion. In consequence, many secondary lines are today carrying a greatly increased volume of freight traffic, thereby making a valuable contribution to the war effort. In most cases the additional mileage involved is surprisingly small and can be considered as negligible in relation to the wastage of engine and manpower which would inevitably be incurred if trains were confined to the more direct routes. It is true that these secondary routes may not be so well equipped with the side-tracking facilities which are so important in freight train operation, but this deficiency has been remedied to a substantial extent by the rapid construction of additional refuge sidings and loops at key points.

This is by no means the only important advantage afforded by the use of alternative routes. Their value has always been recognised as a means of maintaining communications at times of emergency occasioned by the obstruction of normal routes by

* Bulletin No. 298, 1937

† Proc. I.Mech.E. 1878, p. 567; 1879, p. 170

accidents, floods, landslides, or other contingencies. The diversion of trains in these circumstances is subject to a number of considerations which manifestly could not be left to a last-minute decision, and comprehensive instructions have been framed for the guidance of the staff concerned. The network of railway communications in this country is such as to afford several alternative routes between most points and the selection of the most convenient route requires careful consideration in conjunction with a number of important factors. The character of the various trains likely to be diverted must obviously have an important bearing on the selection of an alternative route; through express trains are not necessarily diverted over the same route as semi-fast trains conveying passengers for intermediate stations. Another important consideration is the physical nature of the various alternative routes; some, for instance, may include steep gradients necessitating the use of a bank engine; there may be restrictions on the use of certain engines, involving a reduction in the loads of trains requiring to be diverted; or there may be similar restrictions on the type of rolling stock permitted to pass over the line. All these known factors are carefully considered in framing the standard instructions for the diversion of trains so that, in the event of emergency, the officials concerned may have a reliable basis on which to proceed.

Immediately a diversion of trains becomes necessary there are a number of detailed arrangements to be made. Divisional or District Officers must be acquainted of the position and advices sent to station masters and controls concerned. The provision of suitable engines for working over the alternative route in the event of the normal train engines being of a restricted type must be given attention. The provision of pilotmen or conductors in cases where trainmen of diverted trains have not the necessary road knowledge for working over the alternative route is another feature which must receive prompt attention. Steps must also be taken to see that the necessary facilities are provided to meet local requirements by the operation of shuttle services between the diversion points and stations on either side of the obstruction. It may also be necessary to arrange for intermediate signal boxes to be opened specially to facilitate the working of trains over alternative routes. Most of these arrangements are made through the control organisation which, by means of its comprehensive system of telephonic communications, plays a vital part in the introduction of diversion arrangements in times of emergency. The events of the last three years have lent added importance to the arrangements for the diversion of trains and there have been many occasions when the existence of one or more alternative routes has greatly facilitated the maintenance of communications and enabled the vital work of transport to proceed with a minimum of disturbance and inconvenience.

State Acquisition of Spanish Railway Securities

UNDER a Law dated February 27 last, securities of the Spanish broad-gauge railway companies, whose concessions were rescinded and whose lines were taken over by the Government on February 1, 1941, are to be exchanged against State securities. A further Law, passed on March 13 last, provides for the railway securities thus passing to State ownership to be entrusted to the administration of the Ministry of Finance, and for all other assets and rights of the companies concerned to pass to Red Nacional de los Ferrocarriles Españoles (National System of Spanish Railways). It is stated that this transaction involves shares and debentures representing a nominal value of more than 2,600,000,000 pesetas (about £103,092,000 at par of exchange), although their actual value, according to recent quotations at Spanish exchanges, is not quite 1,500,000,000 pesetas. Some particulars are given in the following table:—

	Nominal value Pesetas	Stock Exchange value Pesetas
Shares		
Northern Railway Company ...	245,100,100	97,290,000
Madrid-Zaragoza-Alicante Railway Company	236,077,850	74,550,000
Debentures		
Northern Railway Company ...	1,159,236,075	678,046,299·50
M.Z.A. Railway Company ...	955,278,625	494,183,536·75
Central Aragón Railway Company	77,273,560	50,945,400
Portugalete	7,621	5,413,100
	2,672,973,831	1,400,428,336·25

The State securities to be offered in exchange bear interest at 2½ per cent. The exchange is not compulsory and those who retain their securities keep all their rights. As recorded in our April 2 issue, a credit of nearly 100,000,000 pesetas for the acquisition of railway equipment for the National Railways has been granted to the Ministry of Public Works in accordance with the provisions of a Law dated March 2, 1943. The Nationalisation Law of January 24, 1941, under which the broad-gauge railway companies were taken over by the Government as from February 1 of that year, was described in *The Railway Gazette* of March 28, 1941.

Hydrogen and Hair-Cracks in Steel

AT a recent joint meeting of the Iron & Steel Institute, the Sheffield Society of Engineers & Metallurgists, and the Sheffield Metallurgical Association, two important papers were read, one on "The Formation of Hair-Line Cracks," and the other on "The Determination of the Solubility of Hydrogen in Iron and Iron Alloys." The relation between these two subjects lies in the fact that there is an increasing tendency to attribute the existence of hair-cracking or shatter-cracking in steel to the presence of hydrogen: and the importance of the matter to the railway engineer is that such shatter-cracking may have harmful, and, indeed, dangerous effects on various forms of steel on which direct dependence for safety is placed, as, for example, the steel rail. As is well known, researches in this country and the United States have established the fact that controlled cooling, through a certain predetermined range of temperature, of rails and other forms of steel that are liable to hair-crack or fissure development, succeeds with a substantial measure of reliability in preventing the development of this defect, but conclusive reasons for the existence of this condition in the steel have not yet been reached.

The British investigators who presented the paper under review came to the conclusion that hydrogen is the fundamental cause of hair-line cracks. They maintained that the hydrogen is not in a solid solution, but that it is held for a time in the form of a constituent rich in hydrogen, which is produced during rapid cooling through the critical range, and that the breakdown of this constituent releases hydrogen, some of which diffuses into voids in the steel and builds up a disruptive pressure. They also held that the influence of chemical composition on the susceptibility of a given steel to hair-crack formation is explained by the effect of that composition on the stability of the resulting hydrogen-rich constituent; confirmation of this view is obtained in the fact that certain alloy steels, such as manganese-molybdenum, chrome-molybdenum, and chromium, show much greater liability to hair-cracking than straight carbon steels. In the discussion on the paper comment was made on the fact that the investigators had used artificial means, going far beyond the possibilities in the ordinary run of steelmaking, in introducing hydrogen into the steel samples on which the whole of their research had been based.

However much the doctors may disagree as to the fundamental cause of hair-cracking in steel, there is fortunately a general agreement as to the cure. As yet, neither the investigators in Great Britain nor those in America appear to have any advice to offer as to how the presence of hydrogen in the steel may be eliminated, or at least reduced to such negligible proportions as to entail no risk by its presence. The British paper now under review, as its final conclusion, makes the statement that whereas the hydrogen-rich constituent in the steel, once formed, must lead to hair-crack formation if it breaks down at a low temperature, hair-cracks will not result if the breakdown can be brought about at a sufficiently high temperature—that is, as a result of controlled cooling. A paper read in 1941 before the American Society for Metals had some very precise information to give on this subject. By exhaustive experiment it was shown that the shatter-sensitiveness of the steel was greatly increased by treating it with varying amounts of hydrogen; the actual shattering was observed to take place as the steel was cooling down between about 200 and 20 deg. Cent., and to continue after the steel had cooled to atmospheric temperature, thus gradually relieving severe internal stresses. The sensitivity of the steel to shatter-cracking depended in part on the mass factor (that is, the size and shape of the steel under test); and the actual temperature at which shatter-cracking began to develop varied with chemical composition and other factors. The holding for 6 hr. at between 200 and 150 deg. Cent. of steel which had been heavily treated with hydrogen proved sufficient completely to prevent the formation of shatter-cracks, and to permit subsequent cooling out in air without risk; if the steel was held at a higher temperature, a shorter time sufficed to ensure immunity, and this is all to the good. Whatever the initial cause of hair-cracks or shatter-cracks therefore, it is satisfactory to realise that a reliable and simple cure is available in the control of cooling. Until the correct method of prevention has been thought out, controlled cooling of rails, and other forms of steel that may be subject to hair-crack development, will continue to be essential.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

War Bonus for Railway Officials

To the Editor of The Railway Gazette

Sir,—It may be of interest that the writer of this letter represents one railway official who actually has been forced out of railway service through economic circumstances. After 23 years in positions of increasing responsibility as a mechanical engineer connected with locomotives, carriages, and wagons, I found myself during wartime as the second man in one of our largest railway works, receiving remuneration very little higher than the chief foremen, whose salaries were rightly increased by payment for Sundays and overtime.

The duties and responsibilities were onerous and the hours long. There was no sign of any bonus to cover the vast extra effort we were making on a variety of government and railway work, and the rising cost of maintaining a family regretfully forced me to transfer to another industry which valued my services by adequate payment. I am interested to find that some of the young men working in my department on the slightest of technical matters, are receiving the same salary as I had when assisting in the control of several thousands of employees.

As a measure of the impersonal nature of the railway headquarters' outlook, it is noteworthy that after the years of service mentioned above (and not without some creditable work) no slightest expression of acknowledgment in the form of a letter of thanks was handed to me on the termination of my services. It is my sincere hope that such a fine body of staff as our railway officials should obtain justice in this cause at an early date.

Yours faithfully,
"AELLA"

A Spur near Oxford

Essex House,
Essex Street,
Strand, W.C.2
April 24

To the Editor of The Railway Gazette

Sir,—In the 1877 and 1881 Editions (but not in the 1890 Edition) of Airey's Railway Map of England & Wales there is shown a short G.W.R. spur line from Kennington Junction (2 miles 26 chains south of Oxford Station) crossing to the east side of the River Thames and terminating somewhere in the southerly parts of Oxford.

Mr. MacDermot does not show any addition to G.W.R. mileage from this line being opened, nor reduction from its being closed.

Can you throw any light on the subject of this spur line?

I need hardly add that I am not referring to the spur line of 66 chains length from Millstream Junction to Oxford Old Station on the west side of the river, which was finally closed even for goods traffic on November 25, 1872 (MacDermot Vol. II p. 65), and is shown as written off in the mileage on November 26, 1872 (page 599).

Yours faithfully,
KENNETH BROWN

Education and Training of Railway Staff

May 2

To the Editor of The Railway Gazette

Sir,—A casual reading of Mr. Goodacre's letter in your issue of April 30 might leave the impression that he was hinting at something not unlike plagiarism. I am sure that Mr. Goodacre did not intend this, but in any event as the author of the article, I should like to make it clear that I have not seen his paper on the subject, and did not know that he had written one.

I am glad to find so much agreement with the views I put forward, but those who read my article may notice that the angle from which the subject was treated seems to have been rather wider than that adopted by Mr. Goodacre, if one may judge from his own summary.

On the particular question of technical training, I agree with the view expressed by "Mechanical Engineer" in your issue of April 9, that there is no royal road to mechanical or any other kind of engineering. All I was hoping for was that, on the one hand, it might be possible to find at least some of the recruits for the full technical training required by engineers, be they mechanical, civil, or electrical, from the youngest members of the clerical staff; and on the other, that qualified engineers might perhaps find the door to high administrative positions a little wider open in the future than it has been in the past.

I should be sorry to think that Mr. Goodacre is right in believing that members of the supervisory railway staff will consider the term "N.C.O." in any way disparaging. I doubt whether anyone who has held commissioned or non-commissioned rank in the Home Guard would ever see anything derogatory in those familiar letters.

Yours faithfully,
"RAILWAY OFFICER"

Railway Size and Sustenance

"Charso," Village Way,
Little Chalfont,
Amersham, Bucks.
April 30

To the Editor of The Railway Gazette

Sir,—Your article under this heading in your issue dated April 30, 1943, is still another instance of how misleading figures may be when presented without reference to important relevant circumstances. I am not prepared either to advocate or decry nationalisation of railways; it seems to me, however, important that a journal specialising in the work of railway undertakings should not quote figures in such a manner as to infer that they support a case for individual ownership, whereas actually they do no such thing if the whole of the relevant facts are given. The grouping of the railways took place when the transport of both passengers and merchandise by road was in its infancy and was the unknown factor when the railway managements compiled the estimated profits of the group companies. Road transport was the main cause of the decline in railway receipts, but is not mentioned in the article in question.

Yours faithfully,
J. S. FINDLOW

[Our editorial gave certain facts and figures which as such cannot be disputed. Mr. Findlow's letter does not advance either fact or argument in support of his contention that the figures do not support the case for individual ownership, but merely declares that the figures "do no such thing if the whole of the relevant facts are given." Our editorial merely compared the financial results for 1942 with those of pre-war years and pointed out, quite fairly, that it would be a grave mistake to regard the present record railway earnings as necessarily indicating what could be achieved by a nationalised or unified system under post-war conditions.' Mr. Findlow is in error in stating that the railway managements compiled the estimated profits of the group companies at the time of the amalgamations. The standard revenue provisions were incorporated in the Railways Act, 1921, which was a Government measure, and the fixation of the actual standard revenues was carried out by the Railway Rates Tribunal under Section 58 of that Act. The theory of the Railways Act that the standard charges could be fixed to yield a standard revenue was completely disproved due to the swift growth of road competition. We gather that our correspondent's contention is that with 123 railway companies the fall in net revenue would have been still greater.—Ed. *R.G.*]

Publications Received

The Electrical Year Book, 1943. Emmott & Co. Ltd., Manchester, 20; 78, Palatine Road. 6¼ in. × 4½ in. 333 pp. Price 2s. 6d. net.—This book has long been invaluable to engineers because it is one of the handiest obtainable sources of general up-to-date information on most branches of applied electricity. In this, the thirty-sixth year of publication, the section on dynamo and motor defects has been completely rewritten to make it applicable to the latest types of machine. The sections on control gear, switchgear, and switchboards have been revised; further matter has been added to the sections on meters and the speed control of a.c. motors. Electric traction forms the subject of 19 pages. Signalling, telegraphy, and radio engineering are outside the scope of this otherwise comprehensive work of reference.

Our Birmingham.—An interesting brochure, price 1s., has just been issued by Cadbury Brothers Limited, Bournville, Birmingham, with the aim of stimulating the interests of the young people of Birmingham in the past growth of their city and in its future development. Town planning and rebuilding therefore occupy an important place in the scheme of this book. It comprises 52 pages (9 in. by 7 in.) and includes many fascinating reproductions of old maps and old views, compared with modern scenes and architects' designs for post-war reconstruction. Transport is given adequate treatment as the reason for Birmingham's greatness, and as an essential feature of future development. The trade distributor of the brochure is the University of London Press Limited, St. Hugh's School, Bickley, Kent.

The Scrap Heap

The Southern Railway averaged a collection for salvage of from 70 to 75 tons a month of waste paper during the past year.

* * *

Over 1,500,000 loaded wagons travelled 136,000,000 miles over the L.M.S.R. in a recent four-weekly period. These figures constitute a record for the company.

* * *

A recommendation that railways should instal some form of speed indicator in locomotive cabs was made by a coroner's jury at Toronto recently, when investigating a fatal accident. The jury also urged the authorities to instal signals at level crossings to warn approaching road vehicles of oncoming trains.

* * *

A record of, so far, 129 years of railway service in South Africa is possessed by a family in the Union, all of whom are living. This service commenced in 1892, when Mr. I. J. Pretorius joined the former Nederlandsche Zuid-Afrikaansche Spoorwegmaatschappij; the others began their railway careers in 1913, 1920, 1924, 1928, and 1935, respectively.

* * *

A traditional figure in the American scene—the railway hobo—is vanishing. It is no longer necessary for him to jump aboard a slow-moving freight train, somewhere in the prairies, for a free journey to a more promising part of the country. He can get a job wherever he is. Before the war the annual figure for illegal train riders averaged 3,700,000. Now this has dropped to 850,000, and is still falling.—*From the "Daily Express."*

* * *

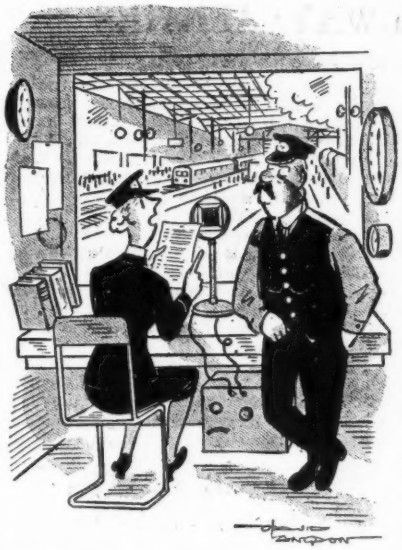
Over half of the £6,100 raised during the recent Merchant Navy Comforts Fund Week at Wolverton was obtained by the L.M.S.R. Carriage Works staff. Rivalry between the various shops in the works produced some remarkable results; the shell forge led with an average subscription of £3 16s. 6d. a head. Fun fairs, dances, socials, workshop competitions, a dog show, and an auction of lemons were staged by the men of the L.M.S.R.; when one of the lemons became unusable through handling, it completed its mission in a specially-built coffin with a glass lid. The total sum raised by the L.M.S.R. Carriage Works was £3,209 6s. 2d., an average of 15s. 2d. from every employee.

* * *

Sir Gervais Rentoul, Magistrate at West London Police-Court, was told recently by Mr. Ormsby-Taylor, prosecuting for the L.M.S.R., that thieving on the railways was "simply colossal." Mr. Ormsby-Taylor said that the present rate of thefts of merchandise in transit by rail represented hundreds of thousands of pounds a year. He was speaking in a case in which 288 bales of blackout cloth were despatched by rail from Bury. When they reached the Ministry of Works & Buildings 41 bales, worth £328, were missing.

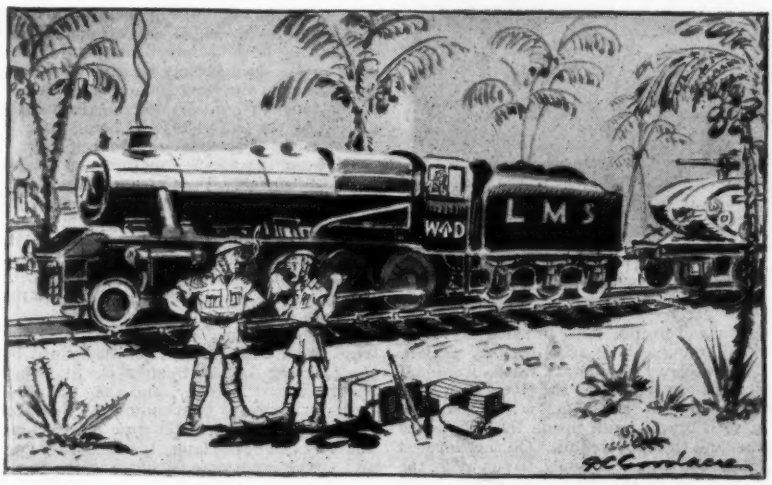
* * *

If the ark had been built by a committee it wouldn't have been finished yet.



"As soon as I say 'The train now standing at Platform 4 is the 5.15 for Upshott, Chislemere, and so on,' you come in with your background of train noises, etc.—Okay?"

[Reproduced by permission of the proprietors of "Punch"



"You'll excuse me tears, sergeant, but it does make me feel so 'omesick!"

Was Her Journey Really Necessary?

The following complaint was recently received by one of our main-line companies from a female traveller:—

"I really think that if one is expected to travel like cattle in trucks one should not be charged first class fare for doing so. Anything to equal the rudeness of the porters at ——— it would be impossible to find or imagine as I have never met it anywhere else. Not *one* could carry my only suitcase across to No. — platform for that awful —— train till at last I got one who said he *might* (and did). If I hadn't found the Inspector who knew me I shouldn't have got a seat at all. I waited 2½ hours as you advised me to do (arriving at ——— at —— *punctually*, no crush, no third class passengers in the firsts, no rudeness) then into my first at your terminus were pressed 4 aside and a shrieking baby of three months old, a man in the corridor smoking into our non-smoking, another shrieking baby next door, and schoolboys rushing up and down yelling past our first carriages—no Inspector or anyone doing anything about it. I travel *twice* a year (not always that) from stern necessity and illness. You ask us *not* to travel while you encourage everyone to do so by bringing *all their children* and travelling first with third class tickets and making it impossible for everyone else. Why not have carriages labelled "children only" and then charge *all* children fares—you would find you wouldn't have anything like the crowds and horrors, and like myself, they would be far better at home. You cram the train at ——— and then re-cram it at ——— and your company used to be the best line in England. Now the ——— is far better. I travelled last Friday having been told the crush would be over by then."

* * *

Vanishing Glory

The L.N.E.R. has decided not to issue silk hats to stationmasters entitled to wear them when the existing hats no longer are presentable. Then it is to be a case of bowlers for all. That will take the shine off m'luds of the rail and make it more difficult for the spectator to determine who is the "lion" of the occasion when a distinguished visitor arrives by train and is received with honour. For close on a century silk has been worn by the masters at nine L.N.E.R. stations, including Newcastle, and perhaps that is long enough. Many of the public, however, will regret the sacrifice of sartorial splendour—the frock coat must go too, for one cannot wear a bowler with that—to the demands of Demos.—*From the "Newcastle Journal."*

* * *

Tailpiece

(*Thieving on the railways has increased*)

I thought I saw a warehouse rat
With whiskers and a tail.
I looked again and saw it was
A predatory male.

Two-legged but very like a rat
In habit and design,
A luggage-lifter, snapper-up,
And bandit of the line.

And sure it is, 'twixt rat and man
The difference is naught,
Except that one is merely jailed,
The other killed when caught.

E. C.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

WESTERN AUSTRALIA

Accident near Swan View

A serious accident occurred shortly after midnight on November 5, 1942, when a goods train hauled by two locomotives got out of control on a steep gradient in a tunnel near Swan View, about 14 miles from Perth on the Eastern Railway, and, running backwards, crashed into a runaway deadend. A driver was killed, and the three other members of the engine crews were injured. The guard jumped clear in time to escape injury. The train concerned, No. 97 goods, bound for Kalgoorlie, was composed of 53 wagons and a brakevan; the contents were mainly personal effects, perishables, and livestock. The weight of the train was 431 tons, 14 tons under the permissible load.

About half-a-mile beyond Swan View, there is a tunnel approximately a quarter-of-a-mile in length, with a gradient of 1 in 49½. The gradient leading up to the tunnel is at 1 in 43·7. The evidence at the inquest indicated that the train entered the tunnel at a speed of from 4 to 5 m.p.h. Both engines were labouring and slipping. Before the train reached the outlet to the tunnel it stopped, and all four enginemen were overcome by carbon-monoxide fumes. (The medical evidence indicated further that the death of the driver was due to carbon-monoxide poisoning rather than to the injuries received later.) The train ran back out of the tunnel, out of control, and, after travelling through Swan View Station at high speed, crashed into the short runaway deadend and piled up. The accompanying illustration gives some idea of the extent of the damage caused to the rolling stock. As a result of the accident, traffic was disorganised to a considerable extent; but, by the use of an alternative route through the ranges, important trains were worked without excessive delays.

General view after the accident to a goods train on the Perth-Kalgoorlie line

At the inquest into the death of the driver, the coroner added the rider: "Although it is possible that this tragedy might not have occurred had not the train stopped in the tunnel, it seems to me from the evidence that it is a dangerous practice to send a train through the tunnel drawn by two engines; and I recommend for the consideration of the Commissioner of Railways that, if the load is too much for one engine to pull, the train be sent through in two sections. Whether the tunnel can be ventilated or air-conditioned is a matter on which I am not competent to express an opinion, but I presume this has already received the consideration of the Commissioner, as, I presume, has also the question of providing some form of protection for the engine crews."

The Railways Department is investigating the questions of improving the conditions in the tunnel by ventilation, and the reduction of train-loads to accelerate the passage of trains over the tunnel section.

UNITED STATES

A New Long Island Tunnel

In the first week of last January the Long Island Rail Road brought into use its new underground line connecting its Brooklyn terminal, at Flatbush and Atlantic Avenues, with Jamaica, the imporant L.I. junction in the Queens district. Hitherto, one-half of the 4·6 miles of line concerned had been carried at street level along the centre of a busy highway with twenty level crossings and the remainder on a viaduct through a residential area of Brooklyn, above the same highway (Atlantic Avenue). The original line had two express and two local tracks, but on the new line the abandonment of all intermediate stations but one has made it possible to substitute a double line for the previous four tracks, and also to accelerate the running time between Flatbush Terminal and Jamaica by from 3 to 4 min. Along the previous section, at surface level, temporary tracks were laid outside those existing; the latter then were taken up and a cutting was excavated between braced walls inside the temporary lines, and then covered in. On the elevated section the trains continued to run along the viaduct while the tunnel was excavated beneath it; the former was supported temporarily on 108 steel bents, of which the weight was transmitted to heavy beams carried on supports on both sides of the excavation. Over the tunnel, Atlantic Avenue is now wide enough to permit four parallel lines of road traffic in each direction, eight in all, with a centre dividing strip, 10 ft. wide, in which there are located the gratings for ventilating the tunnel. At several points some complicated construction was necessary. The only station on the new line which is above ground is East New York, where East New York Avenue passes under the railway, another elevated highway over it, and the elevated tracks of the Brooklyn-Manhattan Transit Corporation above that. There are three traffic levels also at Woodhaven Junction, with the Long Island longitudinally below and the Rockaway Beach line crossing at right angles above the widened Atlantic Avenue.

New Yard at Lincoln, Nebraska

The Chicago, Burlington & Quincy Railroad, which recently has completed an extensive and costly marshalling-yard scheme at Galesburg, on its principal main line 162 miles west of Chicago, is beginning work on a similar $1,300,000 scheme at Lincoln, Nebraska, 55 miles west of Omaha. The plan is for receiving, classification, and departure yards, making up a total of 33 miles of track, with 214 switches, and relocation of 30 miles of existing tracks and 181 existing switches; the yard will be of the hump type, and 14 electro-pneumatic wagon-retarders are to be installed. Floodlighting will facilitate night-shunting work, and short-wave radio will be installed on the shunting engines to permit communication at all times between the yard office and the shunting crews. The new yard is expected to save at Lincoln 175,930 wagon-days and 2,555 engine-days, as well as effecting economies by reducing the amount of shunting at other yards. Second-hand rail will be used as far as possible in laying down the new tracks.

New Works

Contracts have been awarded for the carrying out of a grade-separation plan in the city of Columbus, Ohio. At present James Road, which is an important traffic artery, crosses on the level the jointly-used main lines of the Pennsylvania and Baltimore & Ohio Railroads, a branch line and sidings of the New York Central System, and Fifth Avenue. James Road is to be relocated for a distance of 4,000 ft., and carried over the railways and Fifth Avenue by a five-span reinforced-concrete viaduct, 68 ft. wide, with 56, 71, 55, 86, and 55 ft. spans. As both James Road and Fifth Avenue are used largely to give access to war factories, the work, which is estimated to cost $540,000, and is scheduled for completion by the end of 1943, is being done at the expense of the Federal Government.

Between Blackbird Junction and Island Siding, Minnesota, the Chicago, Milwaukee, St. Paul & Pacific Railroad is relocating its eastbound main track to bring it on to the same side of the Vermilion River as the westbound track. For 3½ miles the westbound track will be used as a single line, with remote electric signalling control; but the remaining 9 miles will be double track.

At Birmingham, Alabama, the Birmingham Terminal Company, jointly owned by the Southern Railway System, the St. Louis-San Francisco Railway, and the Central of Georgia Railway, is spending $357,000 in replacing an old detector-type interlocking plant by one of the latest track-circuit type, and at the same time is changing the 85 lb. per yard rail in the station approaches to 100 lb. rail.

Locomotives of the Future

The great potentialities of modern electric, steam, and diesel locomotives are described and future developments envisaged

THE development and future scope of electric, steam, and diesel locomotive power was the subject of an address on "Railroad Motive Power of the Future," delivered recently before the New York Railroad Club by Mr. Frank B. Powers, Manager of Transportation & Generator Engineering, Westinghouse Electric & Manufacturing Company. Mr. Powers pointed out that the best war job of all was that being done by the railways. Practically overnight, after ten lean and difficult depression years, they had been called on to handle record traffic under abnormally difficult conditions. They had been the only major industry to meet completely the emergency demands for its product. The American nation was beginning to realise that so far from being an outmoded form of transport the railways were still far ahead of any rival.

The Westinghouse company had been closely associated always with the railways and in the past year had received a larger volume of railway business than ever before. The firm was interested in steam, diesel-electric, and electric locomotives and the author believed that each type had and would continue to have a sphere of usefulness. From the start in 1895, electric traction had shown itself to be unrivalled as a means of providing economically mass transport at high speeds. It had reached its highest development in the Pennsylvania Railroad's installation connecting New York, Washington, and Harrisburg. In the future it could be expected to hold the field for heavy suburban service and on main lines with exceptionally heavy traffic and difficult operating conditions. Considerable extension of electrification could be expected, more especially because electricity was the only form of power having a downward price trend. The attainment of high average speeds in suburban service with frequently stopping trains depended on rapid acceleration and deceleration. The smooth action of modern starting and braking controls enabled trains to be run up to as much as 75 m.p.h. in less than 60 sec. without occasioning discomfort. Such a train, operating on a service with the distance between stations averaging 1½ miles, could maintain a schedule speed of 40 m.p.h. No other form of metropolitan transport, not even the private motorcar, could give so fast a service.

On Pennsylvania main lines electric locomotives were achieving results that could not be attained by either diesel or steam locomotives. On passenger service they were called on to develop up to 9,000 h.p. and the freight trains sometimes needed as much as 13,000 h.p. at the driving-wheel treads. A saying in the author's works was that the company had never built a locomotive that the railways had not been able to overload, sometimes before it even got beyond the preliminary design stage. It was true that the railways were always calling for higher and higher power outputs from locomotives. In recent years freight-train speeds had risen from 30 m.p.h. or so to 50 m.p.h. and it was to be expected that with further improvements in brakes, wagons, track layout, and so forth the tendency to higher speeds would continue. Locomotives which now developed 5,000 h.p. merely to keep trains running at a uniform speed on the level would soon be superseded by larger units capable of continuously exerting up to 10,500 h.p. The Westinghouse company was already anticipating the need for electric locomotives to give a continuous horsepower of 7,500 and a maximum speed of 100 m.p.h. Such a locomotive could be designed to have an axle loading of not more than 50,000 lb. and it would therefore be suitable for any American railway. It could be used without a change of gearing for passenger or freight service. The new locomotive would require radically new electrical equipment and, like equipment developed for railways in the past, it would achieve a new standard in output considering the space occupied. "Railway equipment had always pioneered the way to higher safe speeds and temperature limits in electrical apparatus.

The steam locomotive, always supposed to be on the point of becoming obsolete, had more lives than the proverbial cat and it continued to have many desirable features for certain classes of work. From the economic standpoint it was hard to match. It had a low first cost and therefore it was well adapted to railway traffic requirements which rarely demanded more than a very modest yearly mileage from locomotives, say, 55,000 miles in passenger service and 35,000 miles in freight service. Diesel-electric and electric locomotives had been given much publicity in recent years but in the meantime the steam locomotive had been considerably developed and present machines were far ahead of those built 20 years ago. The power developed at driving-wheel treads was about 3,800 h.p. for three driving axles, 4,500 h.p. for four driving axles, and 5,500 h.p. for five. Articulated six and eight driving-axle locomotives gave some 6,000 h.p. With capacities of these high orders the present-day locomotive could still be considered as a powerful and efficient instrument for moving high-speed passenger and freight traffic. However, it did seem that the limit to its possible development on conventional lines was being reached. The turbine locomotive showed promise. Turbines could be built to weigh about 1 lb. for each horsepower developed, which was as light as an aeroplane engine; even with the gearing, flexible drive connections, and so

(*Continued on page* 493)

Three types of locomotive, two steam and one electric, which show the growth in power and change in methods on the American Great Northern Railway

Preserving Metal Work in Railway Bridges

Some notes on investigations conducted by Mr. George Ellson, Chief Engineer, Southern Railway

By S. G. Morgan, M.Inst.C.E.

THE usual method of preserving metal work in railway bridges is by cleaning and painting or tarring them every few years, and although much investigation has taken place no satisfactory means has been found hitherto which will prevent the corrosion of exposed metal work without the considerable recurring expense of repainting. The matter was referred to by Mr. George Ellson, C.B.E., M.Inst.C.E., Chief Engineer, Southern Railway, in the Paper entitled "Modern Trend of Railway Engineering Practice," which was discussed at the Institution of Civil Engineers on January 19, and the following notes have been prepared by Mr. S. G. Morgan, M.Inst.C.E., on a method which has been evolved with successful results on the Southern Railway.

Between the years 1935 and 1938, ten bridges were constructed on the Southern Railway in which the ordinary steel-plate main girders were encased in concrete; the floors were of the joist-in-concrete type, which has been in use for many years and with which no trouble has been experienced. The photographs reproduced show three of the bridges so treated which were constructed on the new Motspur Park to Chessington Line; the first, one of the earlier bridges, over Malden Road, was recessed between the stiffeners on the main girders with the object of keeping the dead load in the weight of the concrete in the encasing as low as possible.

In later bridges, as can be seen in the second and third illustrations of the bridges over Hogsmill River and Ewell Road at Tolworth, it was considered that the concrete encasing would augment the capacity of the girders so substantially and the improvement in the appearance of the structure would be so pronounced that it was decided these two considerations fully justified the small increase in dead load of the bridge could be supported by the steelwork whilst the repairs are carried out, thus avoiding the necessity for trestling or shoring up the structure, as would doubtless be necessary in the case of a reinforced-concrete bridge.

It is doubtful, too, whether a ferro-concrete bridge could be constructed on the site of a structure which may require renewal, as, due to the vibration from passing trains, the setting of the concrete, after it has been poured, would probably be affected adversely. This type of construction, applied to railway bridges, considerably augments the rigidity of the structures, as any extra stiffness which can be provided in them, combined with the additional inertia which the mass of the encasing provides, is beneficial in damping down the various vibrations set up by passing locomotives, both in the bridges themselves and in the

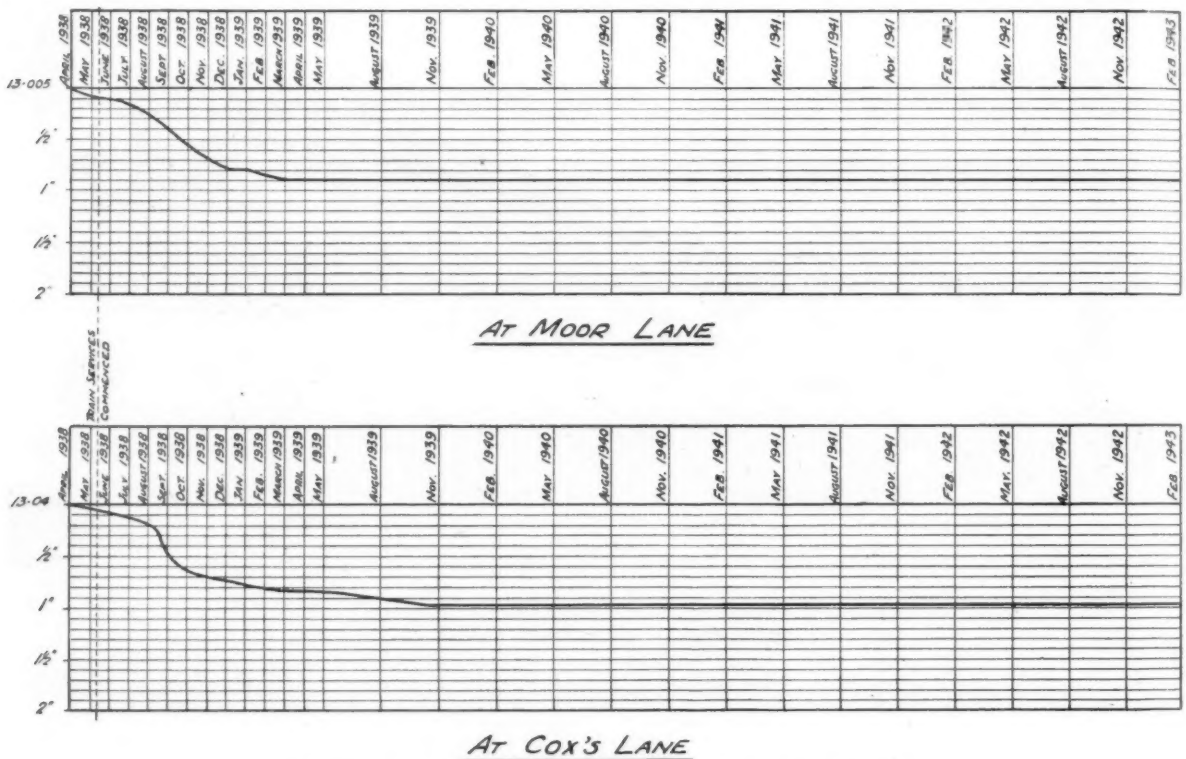


Diagram showing typical settlement curves of bridge abutments

the dead weight to be carried by the main girders, necessary to produce a solid cross section with flush faces on each side of the main girders.

Reinforced concrete railway bridges have not been used to any appreciable extent in this country because of the doubt which exists as to the capacity of this material to withstand the various stresses, including impact effects, to which railway bridges are subjected continually by trains passing over them, and there is not, at present, sufficient evidence to confirm that under severe traffic conditions these bridges would remain satisfactory throughout their normal life.

An advantage of the encased type of bridge is that, as the steelwork is designed to carry the whole of the dead load as well as the major part of the live load, should extensive repairs ever become necessary to the concrete, the abutments. This, in turn, reduces the wear and tear on the structures, and also on the locomotives and rolling stock which pass over them.

It has been found that when trains pass over encased girder bridges it is not possible to perceive any difference in the running from that prevailing when the train is travelling on a solid embankment, as the deflection and movement in them due to the live load is so small as to be practically negligible.

Tests with the heaviest Southern Railway locomotives were carried out on the bridges at the time of construction to ascertain the effects of the live load on them, when it was observed that the deflections of the girders were very small when compared with those of an exposed-girder type bridge. A further test on one of them which was made recently with the same class of engines, confirms

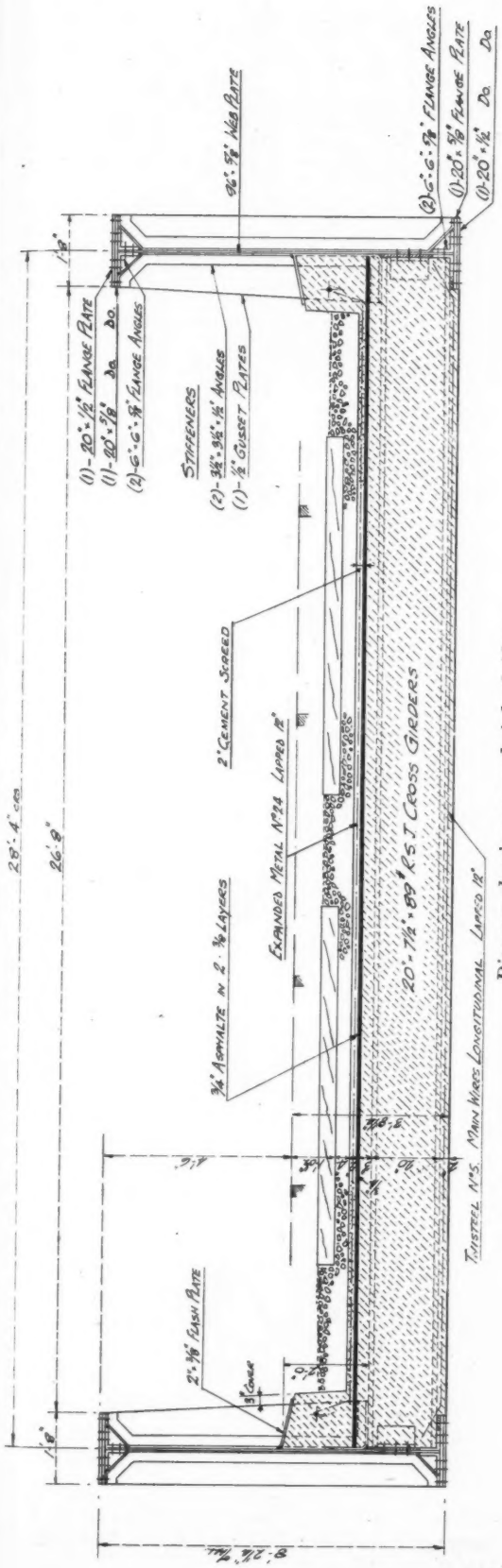


Diagram showing exposed girder bridges

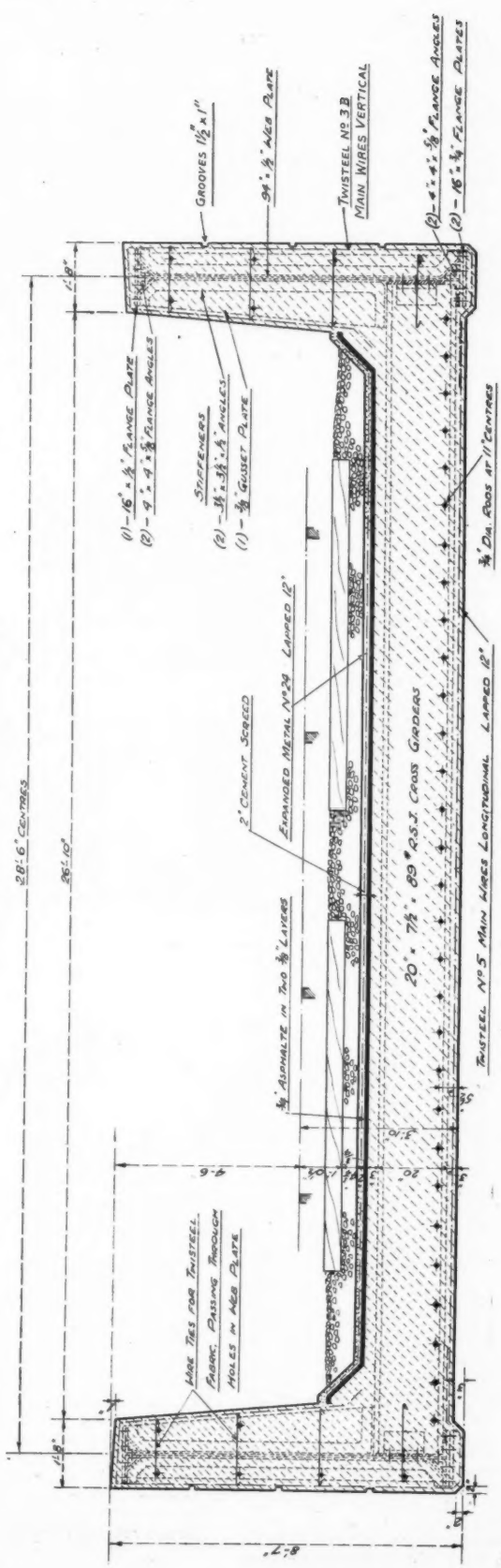


Diagram showing encased girder bridges

PRESERVING METAL WORK IN RAILWAY BRIDGES

that the distribution of the stresses caused by the live load in the structure continues to be satisfactory, and it was found that the stresses in the main girders, due to this loading, were very considerably reduced due to the assistance given by the concrete, when compared with those calculated in the ordinary way for supported beams. Any margin, too, which is usually allowed for corrosion in the thickness of the flanges, the web plates, and stiffeners may be saved. This means that, instead of it being necessary to increase the weight of steelwork to carry the concrete encasing, the reverse is the case, and that the main girders can be made of somewhat lighter sections than if they were left exposed in the ordinary way.

A comparison of the two cross sections shown on page 483 illustrates the extent to which the steel sections in the girders in a 50-ft. span may be modified or reduced.

Appreciable economies in construction and maintenance accrue from encasing the steel main girders of the bridges, and on the assumption that in each case the flooring is composed of cross girders embedded in concrete as shown in the cross sections the quantities of material and labour which vary in 50-ft. spans, are somewhat as follow:—

In (2) main girders	Encased girder bridge	Exposed main-girder type of bridge
Main girders		
Steelwork including bonds and reinforcement	26 tons	32 tons
Painting steelwork		
When first constructed and every 5 to 7 years subsequently	—	309 yd. sup.
Concrete		
For whole superstructure	181 cu. yd.	124 cu. yd.

As to the abutments on which the main girders bear, it would appear, at first sight, that the extra weight to be carried by them, due to the encasing, would be a factor for which to make some provision, but actually it has not been found necessary to make them heavier than those required for a bridge with exposed girders, as their main function is to retain the earthwork behind them, and the extra weight from the main girders, indeed, assists their stability.

In the case of some of the later bridges constructed of this type, observations were taken on the foundations over a period of years to confirm, or otherwise, the question as to whether the additional dead weight of the bridge affected the normal settlement of the abutments, in a clay sub-soil, and in this connection it is interesting to note from the diagrams for two of the bridges (page 483) the recorded settlement of the foundations from readings taken at intervals over a period of some years of normal railway traffic.

In the erection of these bridges no difficulty was experienced, and at a site where one was adopted for replacing an existing bridge, it was built alongside the railway on trestles with permanent way and ballast already laid, and rolled into place during an ordinary Saturday night to Sunday morning possession without any curtailment of the normal railway services. The weight of the new superstructure rolled in was approximately 460 tons.

The encased bridges have been carrying the ordinary traffic of the Southern Railway since the years mentioned above, and the condition of the concrete in the encasing of the structures, although continually subjected to variable stresses, is as good as it was when the bridges were first constructed.

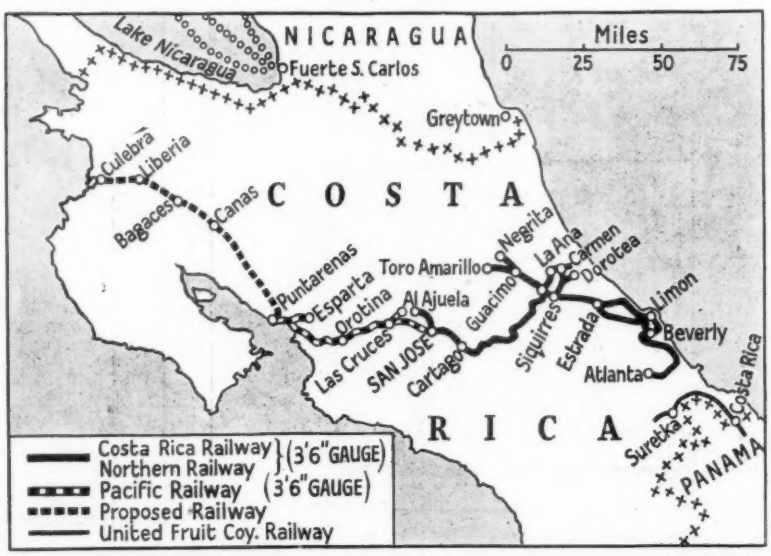
The Railways of Costa Rica

COSTA RICA, the most southerly of the five republics of Central America, has an area of about 23,000 square miles, and a population of 606,581. The country is narrow, and railway communication is limited to the central region, where the capital, San José, situated in the mountains at an altitude of 3,816 ft., is connected with the coast on the east by the Costa Rica Railway from the port of Limón, on the Caribbean Sea, and on the west by the Pacific Railway to Puntarenas on the Pacific. Railway development commenced in Costa Rica with the granting, in 1871, of a concession to the American engineer Henry Meiggs, in the name of the Atlantic Railway Company, for the construction of a line from Limón to San José and Al Ajuela. It is interesting to note that Richard Trevithick was in Costa Rica in 1822-1827, and proposed a railway from the River Sarapiqui to the capital and to certain mines. Had Costa Rica carried out that project an interesting chapter of history might have been written. The Atlantic Railway, after many financial setbacks, was taken over by a British undertaking, the Costa Rica Railway Co. Ltd. This company was registered in 1886, and the completed line from Limón to San José and Al Ajuela was opened to through traffic on December 7, 1890. By the conveyance to the company of 800,000 acres of land the Government became a shareholder, but the early years of the enterprise were marked by financial difficulties, and a committee of investigation was appointed and reported in 1895. At a later date disputes arose out of the competition of the Northern Railroad Company, a subsidiary (dating from 1901) of the United Fruit Company, and lengthy negotiations led, in 1905, to an agreement under which the Northern Company leased the lines of the Costa Rica Company for the length of the concession. Under this agreement the 188 miles of the Costa Rica line were worked by the Northern as part of the system totalling 322 miles operated by the latter, until 1940, when the Northern company defaulted in the payment of the agreed rental. After protracted negotiations, the Costa Rica Railway Company acquired the whole of the share capital of the Northern company. As from July 1, 1941, therefore, the Costa Rica Company operates the two systems as one, through the Northern company (now its subsidiary).

The Pacific Railway, connecting the capital with the coast on the western side of the country, was constructed and is owned and operated by the State. It was originally authorised in 1879, but the entire line to the coast was not completed and opened to service until October, 1910. The railway has recently been electrified throughout. Administration is by an independent council, appointed by executive order. As to future railway development in the Republic, this is limited at present to the Guanacaste concession, a project dating from 1920 for a railway from Puntarenas through the province of Guanacaste to Culebra, also on the Pacific coast, to the north. From the foregoing it will be seen that the public service railway system of the Republic consists of the following lines:—

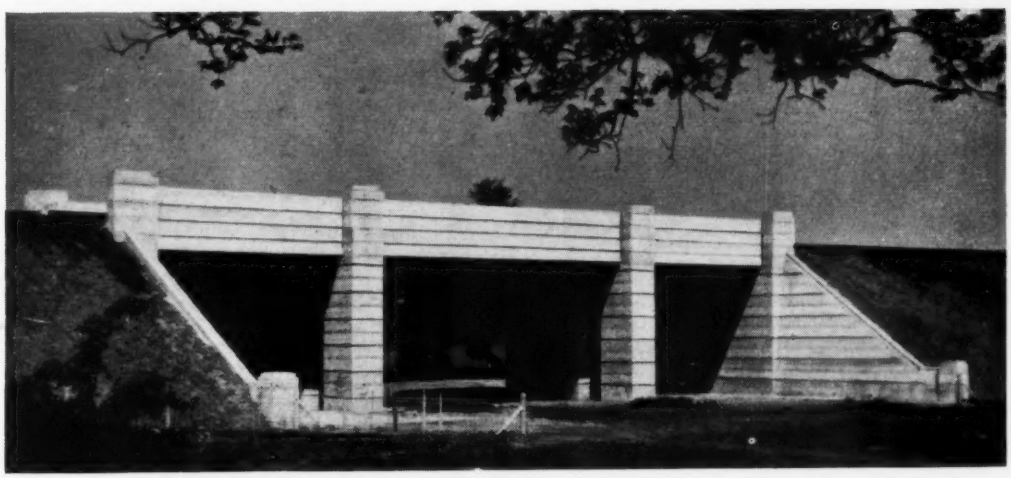
	Gauge.	Mileage
Costa Rica Railway Co. Ltd. (including Northern Railway)	3 ft. 6 in.	322
Pacific Railway (Ferrocarril al Pacifico) (Electric)	3 ft. 6 in.	84
		406

The United Fruit Company, an American undertaking, owns and operates some 590 miles of industrial and plantation railways and tramways, worked in conjunction with the company's undertakings in Panama.

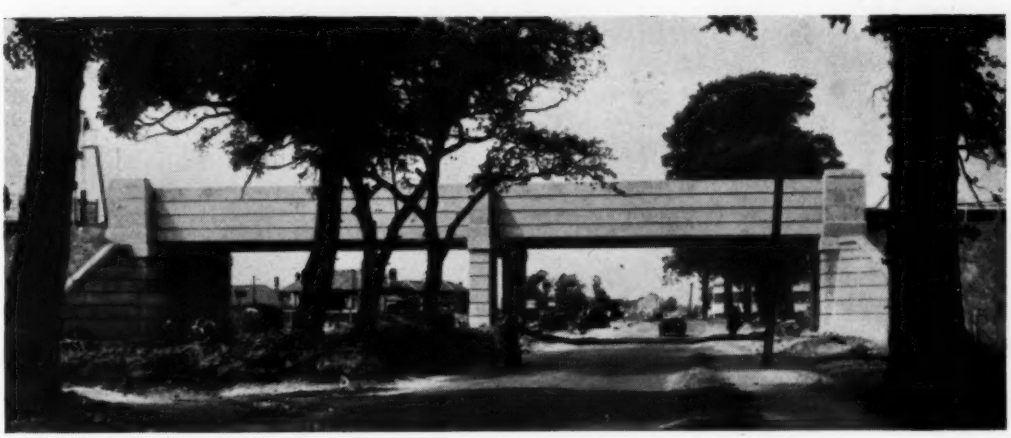


Sketch map of the public railways in Costa Rica; there are also some hundreds of miles of plantation lines

A bridge with encasing recessed between the stiffeners on the main girders with the object of keeping the dead load in the weight of the concrete in the encasing as low as possible



Later examples in which the concrete encasing was considered to augment the capacity of the girders so substantially and so improve the—



—appearance that the small increase in the dead weight carried on the main girders to produce a solid cross section with flush faces on each side was justified

PRESERVING METAL WORK IN RAILWAY BRIDGES, SOUTHERN RAILWAY

(*see article on pages* 482-484)

The Minister of War Transport

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The Rt. Hon. the Lord Leathers of Purfleet, C.H.

The above illustration is of a portrait of Lord Leathers by James Gunn, which is on exhibition at the Royal Academy. Lord Leathers is the first Minister of War Transport. He has held that office since May, 1941, when the Department was created by the fusion of the Ministries of Transport and of Shipping

RAILWAY NEWS SECTION

PERSONAL

At the meeting of the directors of the Canadian Pacific Railway Company after the annual general meeting in Montreal on May 5, Mr. D. C. Coleman was elected Chairman & President, and Mr. W. M. Neal, Vice-President. The following were appointed members of the Executive Committee: Messrs. D. C. Coleman, W. M. Neal, R. H. McMaster, M. W. Wilson, L. J. Belnap, and Aime Geoffrion, K.C. The retiring Directors, Mr. S. G. Blaylock, the Hon. Henry Cockshutt, Major-General F. S. Meighen, C.M.G., and Mr. R. C. Stanley, were re-elected. (*A report of the annual general meeting appears on page* 492).

A tribute to the memory of Sir Edward Beatty was paid at the annual general meeting of the Canadian Pacific Railway Company on May 5, when Mr. Huntly Drummond and the Hon. J. E. Perrault, K.C., moved that there be incorporated in the record an expression of the profound regret of the shareholders at the death of Sir Edward. The shareholders approved the resolution by standing and maintaining one minute's silence. Mr. D. C. Coleman, President of the C.P.R., in his speech to the shareholders had referred to the loss the company had sustained in the death of the late Chairman, and had paid warm tribute to his long and valuable service.

We regret to record the death in Montreal of Mr. G. D. Huband, who was appointed Ministry of War Transport representative in Canada in September, 1941, on the resignation from that post of the late Sir Edward Beatty.

Sir Frederick Heaton, Chairman & Managing Director of Thomas Tilling Limited, and Mr. P. G. Stone Clark, a Director of ten companies in the Tilling Group, have been appointed to the board of Short & Harland Limited; Sir Frederick Heaton becomes Chairman.

We regret to record the death on April 30, in his 63rd year, of Mr. V. H. Chabot, who was a District Engineer, South Indian Railway, from 1917 (in an acting capacity until 1920) until his retirement in 1925.

Señor José Bisbal has been appointed Assistant Traffic Manager, Central Argentine Railway. Señor Bisbal was born in Argentina and commenced his railway career as a station clerk and telegraphist on the Central Argentine Railway. In 1905 he became a relieving clerk, and, subsequently, a relieving stationmaster; and in 1909 he was appointed a chief of staff. In 1911 he went to Buenos Aires as Head of the Timetables Section, and occupied that post until 1923, when he took over also the duties of Secretary to the Traffic Manager. In 1924 he was transferred to Rosario as Assistant Traffic Controller, and in 1926 was appointed General Traffic Controller with headquarters there. In 1933 he returned to Buenos Aires as Traffic Representative, which position he now relinquishes to take up his new appointment.

Mr. G. J. A. Lindenberg, Assistant Chief Mechanical Engineer, South African Railways & Harbours, who, as recorded in our February 12 and 19 issues, has been appointed Chief Stores Superintendent, recently has been serving in East Africa as Assistant Director, Transport (Mechanical), on the staff of the Deputy-Director of Supplies & Transport, with the rank of Lt.-Colonel. He is a member of the Railways & Harbours Conciliation Board, and of the Superannuation Fund Management Committee; and has served on the Accidents Investigation Committee and the Staff Training Committee. He was Chairman of the departmental committee appointed to inquire into the working of the South African Railways & Harbours Sick Fund, and has served on district sick-fund boards. At present he is Vice-President of the Pretoria Railway Institute. Details of Mr. Lindenberg's career were given in our February 19 issue.

Mr. G. J. A. Lindenberg

Appointed Chief Stores Superintendent, South African Railways & Harbours

Señor C. A. Ochoa, Chief of Technical Development & Operation, and a member of the Council of Administration, Argentine State Railways, has been appointed Assistant General Manager (Sub-Administrator-General). Señor Ochoa obtained his civil-engineering diploma in the University of Buenos Aires in 1920, and shortly afterwards entered the service of the Argentine State Railways as an assistant engineer; later he held the positions of Chief of the Way & Works Section at Añatuya, at Cruz del Eje, and at Guëmes, where subsequently he was appointed Assistant Engineer. In 1923, when an extensive programme of construction was started, Señor Ochoa took charge of that of the Curuzú Cuatia branch. In 1926 he was transferred to Buenos Aires as Chief of the Way & Works Division. As the result of the reorganisation scheme carried out in 1929, he was appointed Chief of Technical Development & Operation. From January to May, 1931, and from March to May, 1932, he occupied successively the posts of Second Chief of Traffic, and Chief of the Mechanical Department. In May, 1932, after the appointment of the late Señor Pablo Nogués as General Manager, Señor Ochoa was reappointed Chief of Technical Development & Operation. He represented the Argentine State Railways at the Third South American Railway Congress in Santiago de Chile in 1929, and was a member of the Transport Advisory Committee at the Fourth International Freezing Congress held in Buenos Aires in 1931.

L.M.S.R. Appointments

Mr. S. H. Scholes, Assistant to Superintendent for Organisation & Staff, Chief Commercial & Chief Operating Managers' Departments, to be Assistant (General), Labour & Establishment Office, Watford.

Mr. F. W. Abrahams, Assistant Divisional Superintendent of Operation, Crewe, to be Assistant Superintendent of Motive Power, Watford Headquarters, *vice* Mr. W. Land, retiring.

Mr. J. E. Elliott, District Locomotive Superintendent, Leeds, to be Assistant Divisional Superintendent of Operation (Motive Power), Crewe.

Mr. A. W. F. Rogerson, District Locomotive Superintendent, Cricklewood, to be District Locomotive Superintendent, Leeds.

Mr. J. E. Wood, District Locomotive Superintendent, Nottingham, to be District Locomotive Superintendent, Cricklewood.

Mr. A. Dingley, Assistant, Office of Divisional Superintendent of Operation (Motive Power), Manchester, to be District Locomotive Superintendent, Nottingham.

Mr. J. E. Glisbey, Assistant (Colour Light Signals), Signal & Telegraph Engineer's Department, Watford Headquarters, to be Area Technical Assistant, Watford Junction, *vice* Mr. A. J. Ault, deceased.

Mr. G. R. Mason, Goods Agent, Brighouse, to be Goods Agent, Albion, *vice* Mr. W. J. Theobald, transferred.

Indian Railway Staff Changes

Mr. G. H. Lamb has been appointed to succeed Mr. D. H. Hewitt as Deputy Chief Mechanical Engineer (Carriage & Wagon), G.I.P.R., as from September 28.

Mr. H. Holt-Keene has been appointed to officiate as Chief Electrical Engineer, G.I.P.R., as from August 24.

Mr. D. H. Ferguson has been appointed to officiate as Deputy Transportation Superintendent (Power), G.I.P.R., as from November 2.

Lt.-Colonel G. St. G. Higginson, V.D., Officer Commanding, Bengal-Nagpur Battalion, Auxiliary Force (India), has been honoured by selection for the post of Honorary A.D.C. on the personal staff of the Governor of Bengal. Colonel Higginson is Commercial Traffic Manager, B.-N.R.

Mr. M. Wallace, Solicitor Assistant, Glasgow, L.M.S.R., who, as recorded in

our March 19 issue, has been appointed Acting Solicitor (Scotland), served a law apprenticeship with Mackay & McIntosh, Solicitors, of Glasgow, and joined the staff of the Solicitor to the Caledonian Railway Company in January, 1913. He qualified as a solicitor a year later. He was mobilised with the Territorial Army in August, 1914, and between then and 1918 he served with the 7th Cameronians at Gallipoli and the 12th Highland Light Infantry in France. In 1926 he was appointed an Assistant, dealing with Sheriff Court and general work; and in 1928 he became a Senior Assistant, in charge of Court of Session and Sheriff Court practice, and valuation appeals. During his tenure of this position he has had considerable experience of litigation in all branches of railway and commercial law, and in shipping cases; and has conducted valuation appeals. He was concerned closely with the first quinquennial valuation of the Scottish portion of the L.M.S.R., under the Valuation Act, 1930, and with the extensive litigation thereafter on "let-out" cases in Scotland arising under that Act.

Mr. M. Wallace

Appointed Acting Solicitor (Scotland), L.M.S.R.

Mr. K. N. Eckhard

Superintendent of Electrification, Central Argentine Railway; appointed a chief officer

Mr. P. K. M. Carey

Appointed Solicitor, Great Northern Railway (Ireland)

We regret to record the death on May 6, at the age of 66, of Mr. D. W. Barrie, O.B.E., who retired at the end of 1940 from the position of District Goods & Passenger Manager, Perth, L.M.S.R.

COLONIAL RAILWAY APPOINTMENTS

The Crown Agents for the Colonies recently made the following first class appointments:—

Mr. S. D. M. Robertson to be Assistant Engineer, Gold Coast Government Railway.

Mr. E. M. Smith to be Assistant District Running Superintendent, Nigerian Railway.

From the Supplement to *The London Gazette*, March 30, 1943:—

Territorial Army—Royal Engineers. Major D. C. Urie, M.Inst.C.E., M.I.Mech.E. (34975), resigns his commission, March 31, 1943, and retains the rank of Major.

Major Urie retired recently from the position of Superintendent of Motive Power, L.M.S.R.

Mr. K. N. Eckhard, Superintendent of Electrification, Central Argentine Railway, has been appointed to the rank of a chief officer of the company, retaining his present position. Mr. Eckhard served his apprenticeship with Spagnoletti Limited, and, after gaining experience with the London United Tramways Limited and the London Electric Railway Company, he joined the Central Argentine Railway in 1913, in connection with the electrification of the company's Buenos Aires suburban section. He was engaged at first on the installation of high and low tension cables, but later transferred to work in connection with the construction, equipment, and maintenance of rolling stock. In 1919 he was appointed Resident Engineer of the Electrification Section of the Chief Mechanical Engineer's Department. On the reorganisation, in October, 1925, of the section as an independent department, Mr. Eckhard was appointed Superintendent of Electrification. The electrified Buenos Aires suburban section of the Central Argentine Railway consists of three separate routes connecting the city with Tigre "C," Tigre "R," and Villa Ballester, respectively. That to Tigre "C" was completed in August, 1916, and the other two sections in December, 1931. The electrified system comprises 120 track-miles, including some 27 miles of sidings, and is claimed to be the largest 5 ft. 6 in.-gauge suburban electrification in existence. The average number of trains in daily operation is approximately 500. Mr. Eckhard is also responsible for the control and operation of the company's diesel services.

We regret to record the death on May 2, in his 91st year, of Mr. Hans Renold, founder of the engineering firm of Hans Renold Limited, which was taken over by Renold & Coventry Chain Co. Ltd. in 1932. Mr. Renold was born in Switzerland, and entered the Polytechnic School at Zürich at the age of 18. He engaged in engineering-construction work in Paris in 1871, and two years later came to England, where he was employed as a technical draughtsman and machine inspector. He became a British subject in 1881, two years after he had laid the foundation of the firm of Hans Renold Limited by acquiring the business in Salford of the inventor of the bowl type of chain. Mr. Renold later evolved the bush roller type, starting a demand for chains which caused him twice to move to larger premises. In 1916 he patented the segmental bush bearing for inverted tooth chains. In 1938 the Coventry Chain Co. Ltd. and Brampton Bros. Ltd. were merged with Hans Renold Limited, thus bringing under one control nearly the whole of the British precision-chain industry.

Mr. P. K. M. Carey, B.A., LL.B., who, as recorded in our March 19 issue, has been appointed Solicitor to the Great Northern Railway Company (Ireland), was educated in Dublin at St. Stephen's Green Private School and at Trinity College. He served his articles with the firm of C. H. Denroche & Son, Dublin, and subsequently practised as a partner in that of Potterton & Carey, Wicklow Street, Dublin, up to March, 1941, when he was appointed Assistant Solicitor to the Great Northern Railway Company.

SOUTH AFRICAN RAILWAYS & HARBOURS

Mr. J. Timperley, Superintendent (Staff), General Manager's Office, has been appointed Chief Superintendent (Staff).

Mr. D. H. C. du Plessis, System Manager, Bloemfontein, has been appointed System Manager, Johannesburg.

Mr. P. J. Louw, Inspecting Engineer, Chief Civil Engineer's Office, Johannesburg, has been appointed System Manager, Bloemfontein.

Mr. W. H. Waudby, Controller of Ship Repairs, Union of South Africa (formerly Mechanical Engineer, Pretoria), has been appointed Assistant Chief Mechanical Engineer, South African Railways & Harbours.

Lt.-Colonel W. Marshall Clark, Chief Works & Estates Officer, General Manager's Office, South African Railways & Harbours, has been appointed Controller of Ship Repairs.

TRANSPORT SERVICES AND THE WAR—189

More Gas-Producer Buses

From May 5, eight gas-producer buses are operating on London Transport country bus routes 392 (Epping to Ongar) and 396 (Epping to Bishops Stortford).

"Spring" Strap-hanging

Strap-hangers on the London underground railways are to have a new type of strap, consisting of a tapering spring, through the centre of which runs a flexible cord. A bakelite knob at the end gives the strap-hanger a good grip.

Training Army Drivers

The London Passenger Transport Board has opened another school for training motor drivers for the Army. There are now four centres in the board's area and more than 4,000 men have been trained at them. The output of soldier-drivers now exceeds 500 a month. During the war of 1914-19, a similar scheme was undertaken by the London General Omnibus Co. Ltd., and many thousands of men were trained as drivers for the A.S.C., Motor Transport.

Restrictions on Advance Luggage

From May 15 to September 18 inclusive, luggage will not be accepted under the "Passengers' luggage in advance" arrangement for conveyance to or from all Clyde coast piers served by railway steamers, including Millport and Arran; all piers served by MacBrayne's steamers from Wemyss Bay; Gourock, Wemyss Bay, Craigendoran, Helensburgh, and Helensburgh Upper stations; all stations between Kilwinning and Portpatrick, and between Kilwinning and Largs.

The maximum weight of luggage which may be taken with passengers is 100 lb. for an adult and 50 lb. for a juvenile passenger.

G.N.R. (Ireland) Summer Train Services

As last year, the adoption of Double Summer Time in Northern Ireland, while Summer Time is operating in Eire, has caused timetable difficulties for the Great Northern Railway of Ireland from April 4 to August 14 inclusive. The 9 a.m. from Dublin is unchanged in departure, but reaches Belfast an hour later, at 1.10 p.m.; the 2.30 p.m. from Dublin leaves at 1.30 p.m., and the arrival at Portadown and Belfast is unchanged; the 6.15 p.m. continues to leave at that hour and reaches Belfast at 10.30 instead of 9.30 p.m. A relief express runs from Dublin at 8.45 a.m. to Drogheda, Dundalk, Clones, and Bundoran, daily from June 10. From Belfast to Dublin the 8.30 a.m. leaves at 9.30 a.m., and arrives at 11.40 instead of 11.50 a.m.; the 12.15 p.m. arrives at 2.35 instead of 3.35 p.m.; and the 5.40 p.m. at 8.5 instead of 9.5 p.m.; and a new dining car express runs from Belfast at 6.45 p.m., omitting Portadown and calling only at Goraghwood, Dundalk, and Drogheda, and reaching Dublin at 8.55 p.m. The return Bundoran-Dublin service provides a daily express from June 10 at 4.15 p.m. from Dundalk to Drogheda and Dublin. On the Belfast-Londonderry service the 11.15 a.m. from Belfast starts at 12 noon, and reaches Derry at 3.30 instead of 2.35 p.m., and the 7.5 p.m. from Belfast starts 5 min. later and arrives 10 min. later.

Fuel Crisis in Eire

On April 30 an official announcement was issued in Dublin by the Department of Supplies in Eire to the effect that, by reason of the non-arrival of supplies of petrol, the monthly issue of petrol licences for May would be suspended, excepting for limited numbers of essential categories, to which allowances on a greatly reduced scale would be made. The immediate allowances issued in respect of public transport companies is only 25 per cent. of the allowances granted in April. From Monday, May 3, petrol bus services were reduced by 50 per cent. Limited services are continuing where alternative transport is not available. The Great Southern Railways Company announced the withdrawal from May 3 of the following bus services:—

Dublin and Wexford
Bray and Enniskerry
Dublin and Cork, *via* Cashel
Limerick and Nenagh, *via* Portroe
Limerick and Killaloe, *via* Castleconnell
Kilkee and Loophead
Portumna and Loughrea
Limerick and Cork
Limerick and Waterford
Limerick and Scarriff
Limerick and Killaloe, *via* O'Brien's Bridge
Clonmel and Kilkenny
Waterford and Kilkenny
Cork and Robert's Cove
Cork and Killarney
Kinsale and Garrettstown
Cork and Waterford
Cork and Youghal
Cork and Mitchelstown, *via* Glenville
Cork and Tower (Sundays)
Clonmel and Carrick-on-Suir
Carrick-on-Suir and Portlaw
Cork and Carrignavar
Galway and Longford
Galway and Maree
Galway and Limerick
Galway and Salthill
Westport and Longford
Sligo and Maugherow
Athlone and Longford
Sligo and Athlone
Sligo and Rosse's Point
Sligo and Strandhill
Tralee and Limerick
Tralee and Listowel
Listowel and Ballybunion

In Cork, all Sunday services have been cancelled, and on weekdays last buses leave the Statue at 6.30 p.m. instead of 9.30 p.m. as heretofore.

In addition to complete cancellation, many bus services are now working on specified days only.

The carriage of essential goods is being given priority.

Goods Rates in France

It is reported that railway goods rates in France are to be increased substantially in the near future, but that passenger fares, which were increased on October 15, 1942, are to be left unchanged for the time being.

German Wagon Rope Shortage

One of the minor difficulties in German railway traffic is caused by the shortage of ropes for fastening wagon sheets. In cases where sheets have been fastened with wire, against regulations, shunters have been seriously injured by wire ends left hanging loose on the wagon sides. A widespread custom to nail the sheets to the wagon sides has caused the sheets to be torn along the sides by the action of the wind and to have damaged signal parts along the line, and passengers in passing trains.

Increased Wagon Loading in Balkans

According to the Vienna *Neues Tagblatt* of April 29, the Germans are now loading railway wagons proceeding to Bulgaria, Roumania, and Serbia up to two metric tons above normal capacity; and foreign wagons proceeding to Germany up to one metric ton above capacity. This change is said to be a result of negotiations between the Reichsbahn and railway administrations in other Axis or Axis-occupied territories. The position at the beginning of this year regarding increases in the permissible loading capacity of goods wagons beyond the weight limit indications fixed in normal times, was reviewed in our March 5 issue, page 250.

Danube Ferry Rates Increased

Goods rates on the Danube ferry between Russe and Giurgiu were increased by 50 per cent. from April 15. The increase was applied to both the Bulgarian rates (from Russe) and the Roumanian rates (from Giurgiu).

Hungarian Fare Increases

A 50 per cent. increase in passenger fares was introduced on the Hungarian State Railways on April 15. The main object is stated to be the restriction of unnecessary travel. Recently there has been a considerable expansion in the movement of passengers. For social reasons, the fares for season and week-end tickets for students and workmen were left unchanged. Goods rates were not increased.

Further Goods-Rate Increases in Roumania

Railway goods rates in Roumania were increased by 100 per cent. from April 1 in respect of full wagon loads. Parcels rates were doubled from April 10.

The 100 per cent. increase affects all ordinary goods rates, including those applying to export consignments, but conventional through rates as established for the Roumano-German traffic are excepted. In respect of the Roumano-Bulgarian conventional through rates, the increase becomes effective on May 15.

With a view to easing the position of certain industrial and trading undertakings which would be particularly hardly hit by the doubling of the rates, a few commodities have been excepted for the time being, so far as local rates are concerned. Such rates will be doubled later, in part, on August 1 next, and partly on November 1.

German Transit Traffic through Sweden

Considerable attention is at present being paid to the problem of the German transit through Sweden by railway and over Sweden by air. So far as the transit by railway is concerned, it appears from particulars published in the Swedish press that ten trains a week in each direction convey German officers and soldiers on leave through Sweden between Malmö and Norway. Members of the German Forces are officially stated to embark in non-military formation, and it is further maintained that they do not carry arms, excepting revolvers for officers and bayonets for the rank and file. The trains are guarded by Swedish sentries. Special transit permits must be obtained in advance for the conveyance on such leave trains of weapons, war material of any kind, building material, and even medical stores and uniforms. In addition to the official transit route between Germany or German-occupied Denmark and Norway, there is another German transit traffic of a similar kind between Finland and Norway. Over these routes two carriages are attached twice weekly to the ordinary trains for the exclusive conveyance of Germans on leave, it is stated. This sort of traffic is officially known as traffic in "small trains."

The expenditure the Swedish State Railways incur in connection with the German transit traffic is covered by Germany either through payment in "free currencies" or through the Swedish-German clearing arrangement. Important amounts are involved since the various transit routes

have considerable lengths as specified in the following tables :—

TRANSIT GERMANY—NORWAY

	Miles	Miles
Trelleborg—Malmö	19	19
Malmö—Mjölby...	222	222
Mjölby—Krilbo	157	157
Krilbo—Bräcke	220	220
Bräcke—Storlien*	145	—
Bräcke—Boden	—	390
Boden—Riksgränsen†	—	247
Totals	763	1,255

* Swedish frontier station on the Trondheim line
† Swedish frontier station on the Narvik line

TRANSIT GERMANY—NORTHERN FINLAND

	Miles
Trelleborg—Malmö	19
Malmö—Mjölby...	222
Mjölby—Krilbo	157
Krilbo—Bräcke	220
Bräcke—Boden	390
Boden—Haparanda*	87
Total	1,095

* Swedish frontier station

TRANSIT FINLAND—NORWAY

	Miles	Miles
Haparanda—Boden	87	87
Boden—Riksgränsen	247	—
Boden—Bräcke	—	390
Bräcke—Storlien	—	145
Total	334	622

Swiss Transit Through Spain

The transit through Spain of goods intended for Switzerland, particulars of which were published in *The Railway Gazette* of February 22, 1942, continued throughout 1942, despite many difficulties to which the Swiss traffic organisation was exposed, and which were attributable in the main to three factors : shortage of fuel, shortage of tyres, and shortage of goods to be conveyed. The original fleet of 19 motor vehicles was withdrawn on April 30, 1942, after the termination of the special agreement of which it was the object. It was replaced by a fleet of ten motor vehicles operating partly on wood-gas and partly on diesel oil. The combined services of both fleets were instrumental in importing about 7,000 metric tons of goods in 1942. The average performance a vehicle was 46,575 miles. The adverse conditions obtaining, especially regarding the regularity of supply of goods to be conveyed, resulted in unfavourable financial results, and compelled the Autotransit Genossenschaft to apply for financial assistance from the Swiss Federation.

At first the services were worked over the Badajoz-Canfranc route, in connection with the Lisbon-Entroncamento-Elvas railway service in the south ; Badajoz is the Spanish frontier station, and Canfranc is the Spanish-French frontier station on the railway leading to Pau and *via* Toulouse to Switzerland. This French railway route was not under German control until about the middle of November, 1942.

After the establishment of the sea route between Lisbon and Bilbao for conveyance of goods destined for Switzerland, the connecting motor service was transferred to the much shorter route between Bilbao and Canfranc, which it continues to operate. The road distance between Badajoz and Canfranc is upwards of 600 miles, while that between Bilbao and Canfranc is only about 320 miles.

The shortage of goods for conveyance by the Autotransit service was particularly marked, while the alternative shipping route between Lisbon and Genoa was available, or the direct Bilbao-Irún-Hendaye-Geneva railway connection functioned fairly normally (as it did in certain periods). Then, the Autotransit vehicles were never loaded to capacity and were used only for very urgent consignments. When the shipping route between Lisbon and Genoa was suspended some time ago, a rule was introduced by the Swiss port agent at Lisbon that loading space on the Lisbon-Bilbao shuttle steamers would be allowed only for consignments of which a proportion (normally about 50 per cent.) would be re-dispatched from Bilbao by the road service instead of by rail. This relieved congestion on the Bilbao-Irún railway and assisted in securing more freight for the Autotransit route.

Declining Australian Road Traffic

Approximately 148,000 motor cars have been withdrawn from use in Australia since the war began. Upwards of 28,000 motor cycles have also been taken off the road. Of the total of 854,150 motor vehicles in Australia at the outbreak of war, 610,750 were motor cars ; the balance comprised 243,400 lorries and buses. There were also 77,000 motor cycles.

Canadian Austerity Locomotives

The first of 20 Mikado (2-8-2) class freight locomotives ordered last year by the Canadian Pacific Railway was delivered on April 1. Completion of the order will bring to 84 the total of new locomotives added to the C.P.R. stock since the outbreak of war. With the 20 new locomotives, which will be numbered 5417-5436 inclusive, extensive use has been made of Canadian boiler shell plate ; so far as is known, this is the first time that Canadian-made boiler shell plate has been used for locomotives. For the first time, also, tender tank plate manufactured in Canada has been used in quantity. Before the war, these materials were secured from the United States and from Great Britain. The locomotives are being built by the Canadian Locomotive Company in Kingston, Ontario, to the specification of the C.P.R. They weigh 28 tons (with tenders), and will haul up to 5,500 tons. Special substitute materials have been used to some extent, partly because of supply shortages, and partly to avoid delay in delivery.

Chicago—Pacific Coast Slowings

Further decelerations of long-distance American train services took place on February 14 and 15, and affected a number of the regular trains between Chicago and the Pacific coast, but not the streamliners, whose runs had already been increased from 39¾ to 41¾ for their journeys between Chicago and Los Angeles, San Francisco, and Portland, which range in length from 2,227 to 2,299 miles. The trains since slowed include the Pacific Limited, San Francisco Overland Limited, and San Francisco Challenger (Chicago & North Western—Union Pacific—Southern Pacific); and the Los Angeles Overland Limited, Los Angeles Challenger, and Portland Rose (C.N.W.—U.P.) ; the overall times of the first five now average 60¾ hr., and of the Portland Rose it was 65 hr. 20 min., representing decelerations of from ½ hr. to 7 hr. From the same date the Exposition Flyer which uses the Chicago, Burlington & Quincy, Denver & Rio Grande Western, and Western Pacific route between Chicago and San Francisco (*via* Denver, the Moffat tunnel, and Salt Lake City) was slowed by 2¾ hr. westbound and 3 hr. eastbound.

Recovering Old U.S.A. Rails

It is estimated that by the end of 1942 American railways had released a total of 100,000,000 ft. of rail for service in other locations. From April 22, 1942, under Order L-88 of the Conservation Division, War Production Board, it was made compulsory on the railways to release a certain proportion of used rails in exchange for all new rails, and the disposal of all used rails, except those required by the railways themselves, was made subject to W.P.B. order. From April 22 to December 31 alone, 76,963,843 ft. of rail were released ; of this total, 29,753,273 ft. went to the Army, 11,845,136 ft. to the Navy, 3,645,020 ft. to the Maritime Commission, and 31,725,414 ft. were allocated for miscellaneous uses, such as tracks to serve new industries and extensions of existing railway lines. The 100,000,000 ft. represent all but 10,000 miles of single track ; the figure is remarkable evidence of the extent of railway construction in the United States since that country entered the war. Furthermore, it exceeds by roughly 1,500 miles the total of used rail that the W.P.B. had expected to recover.

Shortage of Railway Watches in U.S.A.

To relieve a shortage of watches needed by the operating staffs of railways in the United States, on February 10 an appeal was directed by the Consumers' Durable Goods Division of the War Production Board to the public asking the latter to sell to the railways suitable watches that are not in use for essential war purposes. Those who respond are invited to take their watches to the nearest retail jeweller, who will direct them to the local railway watch inspector to complete the transaction.

Compulsory Pooling of U.S.A. Terminals

Order No. 100 has been issued by the Interstate Commerce Commission of the United States requiring all the railway companies serving the city of Birmingham, Alabama, to permit the joint use of their terminal stations ; the reason given is that the congestion in certain of these terminals at present is causing serious delay in the movement of locomotives, passenger trains, and wagons. The railways concerned are the Birmingham Terminal, Southern, Illinois Central, Alabama Great Southern, St. Louis-San Francisco, Seaboard Air Line, Central of Georgia, and Louisville & Nashville, and they are required by the I.C.C. to agree on terms for the joint use of these facilities. Failing such agreement, terms will be fixed by the Interstate Commerce Commission.

Burma-China Railway Construction

Some news of the progress achieved in the short time of five months of field work, ended April, 1942, on the Burma-China railway construction is now available. Despite great physical and climatic difficulties, 98 out of the total 110-mile length of line from Lashio to the China frontier were located, 35 miles of the formation were completed, and 12 miles of track were laid.

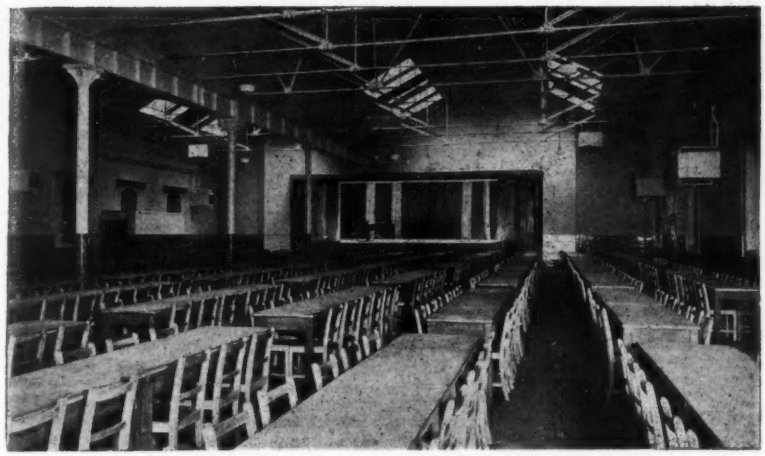
The location survey in particular was a herculean task in dense jungle and on precipitous hillsides for the most part. Shortage of labour, supplies, and equipment made matters worse, and the final setting out of nearly 100 miles of line in such circumstances and in this short time is deserving of the highest praise.

Most of the alignment is in the low-lying and confined Salween valley, much of which is in the form of a deep gorge with sheer rock outcrops at frequent intervals. Malaria is at its worst in this 3,000-ft.-altitude moist heat trap. The difficulty in obtaining and retaining labour must have been almost insurmountable and the discomforts great.

On March 31, 1942, Lashio was bombed by the Japanese and on April 11 orders to stop work and evacuate were received. All work on this vital link was thus abandoned, and cannot be restarted until the Japanese are driven out of Burma.

Great credit is due to Sir John Rowland, the Director, and to Mr. W. J. Lakeland, Chief Engineer, for their undaunted efforts and remarkable achievements.

New Canteen at Derby L.M.S.R. Works



As was recorded briefly in our issue of March 26, Mr. G. L. Darbyshire, Vice-President of the London Midland & Scottish Railway, on March 16 opened a new canteen at the Locomotive Works of the company at Derby. Those present included also Mr. C. E. Fairburn, Acting Chief Mechanical Engineer; Mr. J. Rankin, Works Superintendent, Derby; and Mr. G. Holloway, Deputy-Chairman, Works Committee, all of whom, in the course of his speech, Mr. Darbyshire congratulated on their co-operation in having made possible the building which it was his pleasure to hand over to the canteen committee. He said that the scheme had been in hand before the Ministry of Labour movement for workers' canteens had begun; but shortage of materials had delayed matters considerably.

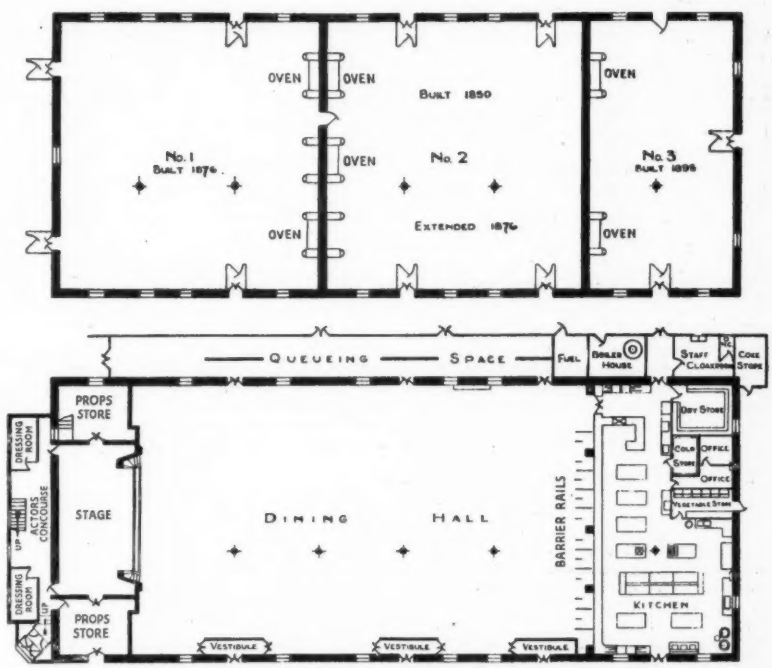
The scheme, which has cost £20,000 to complete, was based on the block of buildings which comprised Nos. 1, 2, & 3 messrooms. A portion of No. 2 messroom, which probably was built about 1850, forms part of the new main dining-hall. In addition to the latter, the accommodation includes a kitchen, concert stage, property and dressing rooms, staff cloakroom, boilerhouse, and food and fuel stores. The area of the building (1,710 sq. yd.) is divided as follows: dining hall, 58 per cent.; kitchen and food store, 17 per cent.; stage and dressing rooms, 13 per cent.; boilerhouse and subsidiaries, 4 per cent.; and corridor in which queues for meals are formed, 8 per cent.

The dining hall, which has a Lithocrete floor conducive to warmth and hard wear can cater for 1,000 persons at one sitting. The heating medium is water heated by a calorifier in the boiler house. The temperature in the hall is kept constant by thermostatic control through a system of heating elements, fans, and circulating pump. A free facility-counter with pressure boiler is installed to provide unlimited boiling water. A Cochran boiler, with a working pressure of 100 lb. per sq. in., provides steam and hot water for the building; the use of gas is confined to the fish-frying equipment.

The cooking apparatus includes twelve coke-fired Aga cookers, Falkirk steaming ovens, boiling pans, and fish fryer, as well as electrical machines for pastry mixing, potato paring and chipping, meat slicing, and food chopping and mincing. Hot and cold storage for dished-up meals is arranged under the specially-designed service counter. Perishable foods are kept in a tiled cold-room, the temperature of which is controlled automatically. Special provision is made for the preparation of pastries, fish, and vegetables, and there are modern facilities for the washing-up and storage of utensils.

Credit for the building work is due to Mr. W. K. Wallace, Chief Civil Engineer, L.M.S.R., and his staff; and to the various contractors, E. Wood & Sons Ltd., Derby (structural work); C. A. Newton & Co. Ltd., Derby, and the Falkirk Iron Co. Ltd. (cookers and electrical machinery); W. Brown (plastering); and Skevington & Son (painting and decorating). The electrical installation was carried out by No. 4 Shop, C.M.E. & E.E. Department, Derby Works.

There is to be joint control of the canteen by a committee representative of the company and of the employees. The canteen staff are servants of the company, some full-time and some part-time, and are subject to the usual conditions of service. The activities of the Canteen Committee include also a mobile canteen service, located in separate premises, for the provision of tea, milk, and light refreshments during working hours; this service already has been in operation for three years. From the surplus receipts it has been possible to install, at a cost of £500, wireless and amplifying equipment not only in the new works canteen, but also in two messrooms situated in different parts of the works; when desired alternative programmes can be relayed simultaneously.



The diagrams show the layout (above) of Nos. 1, 2, & 3 messrooms at Derby Works, on which the scheme was based, before conversion, and (below) of the new canteen building

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SAVING PAPER IN PAY ENVELOPES.—The Waste Paper Recovery Association states that a pay envelope which lasts a year has been used for some time by a well-known firm of publishers. Not only does this save a great deal of good-quality paper, but it embodies a record of the employee's earnings for the whole year. When folded, the envelope is approximately twice the size of the usual type of pay envelope and it uses approximately three times the amount of paper. It is secured by means of a flap, which folds right over the front of the envelope, to which is attached a cord fastening. Inside the flap are set out the income-tax deductions, net wages paid, and signature of the recipient for every week in the year.

Railway and Other Meetings

Canadian Pacific Railway Company

The annual general meeting of the Canadian Pacific Railway Company was held in Montreal on May 5.

Mr. D. C. Coleman, President, in moving the adoption of the report, paid tribute to the services of the late Sir Edward Beatty. During the past forty years his consuming devotion to the company's interest was qualified only by his sense of duty to his country, but in almost every case the interest of each was identical. Sir Edward had sometimes championed programmes and policies that had proved to be unpopular, but those who knew him best could confidently assert that he had never advocated any policy that he did not honestly and sincerely believe would be to the advantage of Canada and of the British Empire.

In 1917, as in 1942, Canada was in the third year of a world conflict, and comparisons between these two years offered a fair basis on which to gauge the striking progress made by the company. In 1917 mobilisation of the industrial and agricultural resources of the dominion was well under way. The major sea routes of the world were then open to allied commerce, and travel was comparatively free from restrictions. The traffic moved over the railway lines of the company's system during that year represented fifteen billion ton-miles of freight, and one-and-a-half billion passenger miles. This was an imposing performance under the then existing conditions, and it was vital to the Dominion, for it was the only railway company in Canada whose lines extended under a single management from coast to coast. On it rested the chief responsibility for efficient wartime transport.

In the present war the transportation requirements had been greatly increased. In 1942 the company moved the heaviest traffic in its history comprising more than twenty-two-and-one-half billion ton-miles of freight and more than two-billion passenger miles. The increase in freight traffic amounted to approximately 50 per cent., and the average time required for its movement was reduced by one-third. Passenger traffic increased to the extent of 40 per cent., and the improvement in equipment provided for the safety and comfort of travellers might well be described as revolutionary. The record of service rendered became even more impressive when it was known that the number of freight cars required to transport the increased traffic was ten thousand less than in 1917, the number of passenger cars one hundred less, and the number of locomotives six hundred less. Moreover, the company's shops in addition to meeting the heavy demands made on them by increased traffic, were engaged in the production of tanks, guns, and other munitions of war.

The steady improvement throughout the last quarter of a century in the company's facilities, its road bed, its motive power, and rolling stock, and its ocean fleets had enabled it to assume its full share of the transport requirements of the nation. The upkeep of all the properties was such that no major betterments had been found necessary to provide for the strenuous conditions of wartime service. The facts and figures relating to the improvements effected had been recorded in the reports of individual years, but a few comparisons of typical tests of efficiency would indicate the degree of advance that had been made. The carrying capacity of freight wagons had increased substantially, and the tonnage per car mile rose from 26 tons in 1917 to 32 tons in 1942. During the same period the average daily mileage made by all freight wagons increased from 30 miles to 42 miles. The combined effect of these factors had been to increase by 70 per cent. the utilisation of freight wagons. Locomotive and train performance had shown an equally marked improvement during the past 25 years. In 1942 the freight train load had been 1,711 tons, nearly one-third greater than in 1917, and freight-train speed between terminals including all delays was almost 17 m.p.h., an increase of 60 per cent. Measured in gross ton-miles the work per hour performed by the average freight train in 1942 was twice that of 1917.

All expenditures on capital account had been met without the issue of new securities, and bonds, notes, and other obligations to the amount of $35,447,000 had been retired without refunding. In the three years ended December 31, 1942, debt redemption amounted to a total of $94,863,000, leaving obligations to the amount of approximately $56,000,000 to be met within the succeeding four years. After careful consideration the directors had reached the conclusion that it would not be in the best interest of the shareholders to declare a dividend on the ordinary stock for the year 1942. As stated when the announcement was made, one of the reasons for the decision was the feeling that there should be a further reduction in fixed charges before the resumption of dividend payments. In 1942 fixed charges had been reduced to $23,000,000, nearly $2,500,000 below the peak reached in 1940, but still considerably above the pre-depression level. There would be a further reduction during the present year, and after the results became available the question of a dividend payment would again be reviewed. The directors had not overlooked the fact that the ordinary shareholders had had no return on their investments since 1932. On the other hand, funds had to be provided for maturing obligations and essential capital improvements. Moreover, the company was faced with the unpredictable financial requirements of the post-war period. Even if earnings continued at their present level and the company's position became such as to warrant a distribution, the prudent policy would be to follow a conservative course in determining the amount of any dividend that might be declared.

As to the outlook for the year 1943—Gross earnings in the first quarter of the present year increased $5,600,000 or 9·8 per cent. over 1942; working expenses increased by $6,900,000 or 14·6 per cent.; net earnings amounted to $8,700,000, a decrease of $1,300,000. Traffic would react quickly to the changing needs of the war situation and particularly to any alterations in shipping conditions. At present he knew of no reason why the traffic trend should change, but he would expect that a large part of any increased gross earnings would be offset by heavier taxes, maintenance, and other expenses. All told it would seem that net income was not likely to vary substantially from the level of last year.

Costa Rica Railway Co. Ltd.

The 58th ordinary general meeting of the Costa Rica Railway Co. Ltd. (adjourned from December 31 last) was held on April 29 at Winchester House, Old Broad Street, E.C., with Mr. H. C. Drayton (the Chairman) presiding. He said, *inter alia*: "We assumed control of the Northern Railway Company of Costa Rica on July 1, 1941, and the accounts deal with our business from that date to June 30, 1942. The net revenue account of this company shows a loss for the year of £35,500, due to the non-payment of £112,900, the balance of the £134,133 due under the working agreement for the year. The working agreement between this company and the Northern Railway Company, which is now the subsidiary of this company, has been kept in existence, and under that agreement our subsidiary had to pay us £134,133. From July 1 last the annual sum will be £126,300. The earnings of the Northern Railway Company for the year ended June 30 last were on balance $343,400, or, say, £86,000. It has been necessary to keep a great part of those earnings in the business for the working capital—that is, financing our debtors and day-to-day expenses. For the first nine months of the year under review the net amount which the Northern Railway Company earned was greater than that which we should have received under our rental, but for the last three months we were badly hit by lack of shipping putting into Port Limon. Since the entry of the United States into the war we have had very few ships calling at our port. It did not help matters when one ship which did put into Port Limon was torpedoed alongside our wooden wharf, and it took months to raise it.

"Working expenses, despite economies, show an increase; this is owing to a big jump in the price of crude oil, which is necessary for the running of the railways. For one shipment alone we paid over 300 per cent. above our pre-war cost. For a subsequent shipment the cost has been considerably abated. As to the prospects of the line, more ships, even if small ones, are putting in at Port Limon, and we are hopeful that the railway will get a good proportion of any coffee exported, even if no bananas are shipped. This, with cocoa, abaca, balsa wood, and some rubber, should add to its receipts. Such rubber as is being shipped at present is wild, but, with the coming into production of the large plantations of the Goodyear Company, this should be an expanding traffic for the railway as these plantations are on our old line. In addition, the American Government is carrying out large experimental rubber growing in our Turrialba area. Also, the construction of the Pan-America Highway cuts right across our line at Cartago, and this should lead to development of the surrounding country, and, provided that roads are not built to the coast, should ultimately benefit us."

The report and accounts were adopted.

The railways of Costa Rica form the subject of a short article, with map, at page 484.

Questions in Parliament

London Bus Service

Captain Sir Austin Hudson (Hackney North—C.) on May 5 asked the Parliamentary Secretary to the Ministry of War Transport, whether the new summer time schedules of the London Passenger Transport Board had been speeded up in such a way as to eliminate the nuisance of the crawling bus; and, if not, whether he would ask the board to prohibit the habit of crawling, which was far more inconvenient to bus travellers than an occasional bus getting ahead of its schedule.

Mr. Noel-Baker: As I said in reply to a question by Sir Austin Hudson on April 21, I hope that the summer schedules now in force may reduce the difficulties which are caused when drivers get ahead of time. Further adjustments of the schedules are now being discussed by the London Passenger Transport Board and its employees. I recognise and regret the annoyance to passengers which results from the practice of "crawling," but I cannot accept the suggestion made in the last part of the question. On the contrary, I believe that, if drivers were allowed to run ahead of their timetables, the inconvenience to the travelling public would be much greater still.

Sir Austin Hudson: Is the Parliamentary Secretary aware that this is a very genuine grievance in London? Could he put the London Passenger Transport Board in touch with me, so that I can discuss with it the many letters I have received?

Mr. Noel-Baker: I shall be glad to put Sir Austin Hudson in touch with the board, and I have no doubt that it will be glad to talk to him. It is doing its best to deal with what is a very difficult matter.

Mr. Evelyn Walkden (Doncaster—Lab.): Does not the Parliamentary Secretary think that it is really inconvenient when it takes a bus 30 min. for the journey from Charing Cross to Kings Cross which is scheduled for 15 min.? Because they are overrunning their time, they do dawdle on the way and commit the offence suggested in the question.

Mr. Noel-Baker: I think Mr. Walkden will find that the inconvenience of running journeys regularly ahead of schedule would be much greater to all concerned.

Easter Holiday Railway Travel

Mr. T. H. Hewlett (Manchester, Exchange—C.) on May 5 asked the Parliamentary Secretary to the Ministry of War Transport whether he was aware that duplicate trains were run by the London Midland & Scottish Railway Company to cope with the rush of Easter visitors from Manchester to Blackpool; that 12 special trains officially described as a re-adjusted service were used to bring such visitors back to Manchester on Easter Monday; and, as such action was contrary to the instructions of his department that there should be no extra travel transport at holiday time, what steps it was proposed to take to prevent a repetition at future holiday periods.

Mr. Noel-Baker stated in a written answer: I am glad to assure Mr. Hewlett that he is mistaken in thinking that the instructions given by my Ministry to the railways about trains at Easter were not observed. The railways were told that between April 22 and April 27 the number of long-distance passenger trains run on any day should not exceed the maximum number run on any weekday or Sunday, as the case might be, in March, 1942; and that no more local trains should be run on Easter Monday than on an ordinary Monday in March, 1942. On Easter Monday the London Midland & Scottish Railway Company ran 11 unscheduled local trains from Blackpool. In the division of that company's system which includes Blackpool, the total number of trains run was more than 100 less than the number which the Minister of War Transport's instruction would have allowed.

Post-War Civil Aviation

Mr. O. E. Simmonds (Birmingham, Duddesdon—C.) on May 5 asked the Minister without Portfolio, whether he would give an assurance that no decision had been taken by the Government which would have the effect of placing all British overseas air transport services after the war in the hands of one organisation.

Sir William Jowitt (Minister without Portfolio): Yes, Sir.

Mr. Simmonds: Would the Minister bear in mind that it will be a major disaster if there is no real enterprise in our air transport services after the war, and could he say exactly what are the implications of the decision he has just announced?

Sir W. Jowitt: As I explained the other day, we have been careful not to attempt to fix the national set-up until we know what arrangements, if any, can be made internationally with regard to civil aviation.

Mr. Simmonds: May we assume that there is absolutely no decision of any kind so far?

Sir W. Jowitt: That is the effect of my answer.

Staff and Labour Matters

Railway Trade Unions

As announced in our March 12 issue, the three railway trade unions, the National Union of Railwaymen, the Associated Society of Locomotive Engineers & Firemen and the Railway Clerks' Association have agreed that all future major wage claims should be the subject of joint consultation before submission to the employers. The three unions also set up a joint sub-committee to devise machinery to co-ordinate policy on matters of common interest and the executive committees of the three unions have now reached the agreement below:—

1. That a joint committee be formed representing the three unions to consist of twelve members, four from each union, exclusive of the President and General Secretary of each organisation.

2. That the object of the committee shall be to assist in creating the maximum amount of unity of purpose on matters of common interest to the three unions, for example, important matters for negotiation with the railway authorities; legislation affecting railways or railway workers; and other matters where agreement is desirable.

3. The committee shall be consultative and advisory in character and its decisions shall be subject to endorsement by the respective executive committees.

4. The committee shall meet once every three months for general consultation. Special meetings can be convened at any time on a request of any of the parties.

5. The chairmanship of the committee shall be held in rotation at each meeting by the respective presidents. All announcements of the joint committee shall be agreed between the three general secretaries before publication.

An appendix to the agreement states that in furtherance of the principles contained in paragraph 2 of the constitution, it is also recommended:—

(*a*) That before meetings with the Railways Staff Conference, Railway Executive Committee Staff Committee and Railway Staff National Council, as far as practicable, and where agreement has not previously been reached by the joint committee, there shall be a meeting of the representatives attending such meetings for the purpose of co-ordinating policy.

(*b*) The union which has submitted the individual item shall assume the task of advocating it.

(*c*) Suggestions made by the companies on matters of common interest to the parties shall not be accepted unless approved by all the unions.

(*d*) In the light of practical experience of the working of the constitution, and appendix thereto, it will be within the province of the joint committee to make suggestions to the executive committees for such alterations or additions as might be considered desirable.

Locomotives of the Future

(*Concluded from page* 481)

forth the weight would probably be only 5 to 7 lb. per h.p. which is much less than for any other kind of power equipment. A conventional boiler fitted with an ordinary superheater and giving steam at about 300 lb. per sq. in. would suffice. The turbine would provide a starting effort up to the limit of 0·25 of the adhesive weight, even though geared to give a high train speed. From 0 to 25 m.p.h. it would be less efficient than the reciprocating engine but beyond this it would give worthwhile economies. It would also eliminate troubles arising from under—or over—balanced reciprocating masses.

The Westinghouse company had studied the application of the direct-geared non-condensing turbine for several years and saw the way to building locomotives that might be expected to develop 20 to 25 per cent. more power than conventional locomotives at the higher speeds, though consuming the same amount of steam.

From its first application to railway service, about 1925 till the present time, diesel-electric power has steadily increased in popularity and units totalling about 2,000,000 h.p. were now in operation or on order. In shunting service the favoured sizes were 660 h.p. 100-ton locomotives and 1,000 h.p. 125-ton locomotives though smaller units were being adopted. In 1941 some 12 per cent. of all shunting duties on Class I railways had been performed by diesels.

In high-speed passenger service 2,000 h.p. units which could be coupled to give 4,000 and 6,000 h.p. were becoming usual. In 1941 diesel-hauled passenger trains covered about 30,000,000 miles, or 7 per cent. of the total passenger train mileage in the country. This proportion was small but it was increasing rapidly.

In freight service there were diesel locomotives of 2,700 h.p., 4,000 h.p., and 5,400 h.p. Up to January 1, 1942, diesel freight locomotives aggregating 237,000 h.p. had been purchased.

Further development of the diesel was dependent on the extent to which the weight and bulk of the engine itself could be reduced by resorting to a higher rotational speed. In a 2,000 h.p. locomotive of 1940 the engine and drive constituted about 44 per cent. of the total weight. The Westinghouse company expected very soon to be able to offer a single-cab unit developing 6,000 h.p. and having electric braking.

XUM

Notes and News

Gera Trams.—The Strassenbahn Gera A.G. (Germany) reported working receipts totalling RM. 5,230,000 for the year ended June 30, 1942, compared with RM. 4,910,000 for the previous financial year. The increase is said to be mainly the result of the expansion of passenger traffic.

Vienna Local Railways.—The share capital of the Aktiengesellschaft der Wiener Lokalbahnen was recently reduced by RM. 243,000 to RM. 4,972,000 through the redemption of 1,215 shares. The company owns and operates various local lines in the neighbourhood of Vienna, the most important of whch is the electric line connecting Vienna with Bratislava, the capital of Slovakia.

South African Railways Earnings.—Earnings of the South African Railways for the period March 8 to April 10 amounted to £4,310,406, compared with £3,887,943 for the corresponding period of 1942. Earnings for the calendar week ended April 3, 1943, were £902,997, which constitutes a record and is the first time in the history of the South African Railways administration that the weekly total has exceeded £900,000.

Electrification of Bulgarian Railways.—According to a message from Sofia to the Official German News Agency, a 20-year plan is being worked out for the electrification of the Bulgarian State Railways. Among the reasons given for the plan is the fact that at present between 350,000 and 400,000 tons of coal a year are needed for the railways, and that the transport of this fuel forms 25 per cent. of the total goods traffic.

National Steel Car Corporation Limited.—The company has announced that payment for its aircraft plant at Malton, Ontario, taken over by the Dominion Government, has been completed. The amount in question was approximately $4,000,000. The announcement also states that the board is considering the company's dividend policy. In the meantime, a bonus of $1 a share, in addition to the usual quarterly dividend of 50 cents a share, has been declared.

British Aluminium Co. Ltd.—Accounts for the year 1942 show a profit of £419,869, after making provision for taxation, and after charging amounts required for service of debenture stock and after setting aside £50,000 to depreciation reserve, and £150,000 to reserve fund. Adding £222,128 brought forward makes £641,997. After providing for dividend on preference stock, the directors recommend a final dividend of 7 per cent. on the ordinary stock, making 10 per cent. for the year, and leaving £251,997 to be carried forward.

Hoffmann Manufacturing Co. Ltd.—The report for the year 1942 states that the profit after providing for maintenance, renewals, depreciation, taxation, directors' remuneration, trustees and auditors' fees, etc., was £222,334; add balance brought forward £58,111, making £280,445. Transfers are made of £25,000 to debenture redemption reserve and £50,000 to general reserve. The directors recommend a final dividend on the ordinary shares of 10 per cent., free of tax, making 17½ per cent. tax free for the year, carrying forward £67,869.

Indian Railway Collision.—On the morning of April 2, the No. 14 down express collided with the engine of a goods train at Mansuri Station, near Allahabad, on the East Indian Railway. Through communication was interrupted and traffic was diverted *via* Unao-Unchahar and Phaphamau. Driver Stanford of the express and four other railway employees were killed; 37 passengers were injured, 5 of them seriously. The injured were taken to Allahabad. No. 14 down was a new train introduced only on the day before the accident, when the new timetable was brought into force.

Anatolian Railway Debentures.—The No. 107 coupon series I, and the No. 99 coupon series II of the formerly German-controlled Anatolian Railway Company, due for payment on April 1, 1943, are stated to have been paid in Germany at the rate of RM. 59.65176 for each Swiss francs 100.

Ecuador - Colombia Air Link.—A weekly air link was established recently between Bogota (Colombia) and Quito (Ecuador). The service between Bogota-Cali (Ecuador) and Ipiales (Colombia) is maintained by Avianca; that between Ipiales and Quito is operated by Panagra. The northbound journey is scheduled to take 5 hours, and the southbound 6½ hours.

Central S.M.T. Co. Ltd.—In April, 1942, the capital of this company (a subsidiary of the Scottish Motor Traction Co. Ltd.) was reduced from £750,000 to £562,500 by repayment to stockholders of 25 per cent. of their respective holdings (see *The Railway Gazette* of April 17, and of May 1, 1942). The authorised capital now has been increased to the former sum of £750,000.

Pinchin, Johnson & Co. Ltd.—Preliminary figures for 1942 show a net profit of £453,121, an increase of £142,262 from the previous year. Provision for income tax and E.P.T. requires £270,000. It is proposed to add £60,000 to reserve for contingencies, and to pay a final dividend of 6 per cent., less tax, on the ordinary shares, making 8½ per cent., less tax, for the year (same), carrying forward £169,202 (£151,772).

Springs-Welgedacht Line in South Africa.—In view of the expansion of mining activity on the East Rand, the construction by the South African Railways of a line from Springs to Welgedacht has been authorised. Traffic from Apex, which is increasing, at present has to undergo a considerable amount of marshalling. The construction of the Springs-Welgedacht line will avoid making considerable extensions to the Apex yard. The length of the line will be approximately six miles; the estimated cost is £107,750.

Argentine Foreign Trade.—The foreign trade of Argentina in January and February this year showed a favourable balance of 123,082,000 pesos (£7,384,920), an increase of 45,835,000 pesos (£2,750,100). Exports and imports were as follows:—

	Tons	Value Pesos
Exports	715,000	264,451,000
Imports	531,000	141,369,000

Exports in the same two months of 1942, were valued at 317,915,000 pesos (£19,074,900), and imports at 240,668,000 pesos (£14,440,080), leaving a favourable balance of 77,247,000 pesos (£4,534,820).

P. & W. MacLellan Limited.—As shown by the report for the year 1942 the net profit after allowing for directors' fees and all proper charges, including provision for taxation and contingencies, was £42,190. Adding £8,466 brought forward makes £50,656, from which are deducted £6,561 for debenture interest, £7,500 transfer to depreciation fund, £3,000 provision for deferred repairs, and £5,000 transfer to reserve fund, leaving £28,595. The directors recommend a dividend of 6 per cent. per annum on the ordinary stock (same), carrying forward £8,075.

Farm Removal by Railway.—One of the largest single farm removals ever undertaken by the railways was completed recently. The owner of Tong Hall, a well-known Yorkshire estate, having acquired an estate at Stowey, Exmoor, entrusted the removal arrangements to the London & North Eastern and Great Western Railways. All the livestock including the farm herd of Ayrshire cattle, was loaded, and passenger accommodation for the estate staff was pro-

British and Irish Railway Stocks and Shares

Stocks	Highest 1942	Lowest 1942	Prices May 7, 1943	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	58	39	64½	+ ½
5% Con. Pref. ...	115½	105½	117½	— 1
5% Red. Pref. (1950)	109½	103½	108	—
5% Rt. Charge ...	133½	123½	133½	— 2
5% Cons. Guar. ...	130½	121½	132½	—
4% Deb.	117	105	114	—
4½% Deb.	118	108	117½	—
4½% Deb.	125	113	123½	—
5% Deb.	137	127	136	—
2½ Deb.	77	70	76	—
L.M.S.R.				
Ord.	28½	16⅜	34½	+ ½
4% Pref. (1923) ...	63½	50½	65	+ ½
4% Pref.	76½	67½	78½	— 1
5% Red. Pref. (1955)	103½	94⅜	104½	—
4% Guar.	104½	97½	102½	— 1
4% Deb.	108⅜	101½	106	— 1
5% Red. Deb. (1952)	111	107½	109½	—
L.N.E.R.				
5% Pref. Ord. ...	9⅜	2⅜	11½	+ ⅜
Def. Ord.	5	1⅛	4⅜	— ⅛
4% First. Pref. ...	62	49½	64½	—
4% Second Pref. ...	32½	18¼	35½	— ½
5% Red. Pref. (1955)	95½	79	96½	—
4% First Guar. ...	98	88	99	— 1
4% Second Guar. ...	90	78	92	— 1
3% Deb.	85	76	82	— 1
4% Deb.	106⅜	100½	105	— 1
5% Red. Deb. (1947)	106	103	104½	—
4½% Sinking Fund Red. Deb.	106	102½	106½	—
SOUTHERN				
Pref. Ord.	77	61½	79½	+ ½
Def. Ord.	23½	14½	26	+ ½
5% Pref.	112⅜	104	116½	— ½
5% Red. Pref. (1964)	110⅜	105½	112½	—
5% Guar. Pref. ...	131	121½	132½	— 1½
5% Red. Guar. Pref. (1957)	115½	109½	114½	—
4% Deb.	116	104½	112	— 1
5% Deb.	134	125½	135	—
4% Red. Deb. (1962-67)	110⅜	106	110½	—
4% Red. Deb. (1970-80)	111	106½	109½	— 1
FORTH BRIDGE				
4% Deb.	109-7/8	108	108	—
4% Guar.	105½	100	104½	—
L.P.T.B.				
4½% "A"	122½	111	122½	—
5% "A"	131½	122	130½	—
3% Guar. (1967-72)	95⅜	97⅜	100	—
5% "B"	121	111⅜	120½	—
"C"	56½	38	63½	—
MERSEY				
Ord.	27½	20½	29½	—
3% Perp. Pref. ...	61½	56½	62	+ 1
4% Perp. Deb. ...	102⅜	99⅜	104	—
3% Perp. Deb. ...	80⅜	76	79	—
IRELAND				
BELFAST & C.D.				
Ord.	9	4	9	—
G. NORTHERN				
Ord.	29⅜	12½	19½	+ 2½
G. SOUTHERN				
Ord.	25	10	9½	— ½
Pref.	29	12⅜	12½	—
Guar.	53	35⅜	27	—
Deb.	71½	55⅜	54½	+ 1

§ ex-dividend

OFFICIAL NOTICES

OFFICIAL ADVERTISEMENTS

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

Buenos Ayres Great Southern Railway Co. Ltd.

THE Directors of the Buenos Ayres Great Southern Railway Company Limited, hereby give notice that the Register of Debenture Stockholders of the Company will be closed from Saturday the 15th May to Saturday the 22nd May, 1943, both days inclusive.

By Order of the Board,
J. M. HOBDAY,
Acting Secretary.

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vided. On April 17 the final train was hauled out of Birkenshaw Station for its journey of 272 miles. Within less than 18 hr. the normal life of the estate, suspended in Yorkshire, had been resumed in Somerset. The removal entailed the use of 121 wagons.

Prizes for Platelayers.—London Transport has this year extended its scheme for awarding prizes to the staff for the best maintained sections of the railway. The scheme, which has been in successful operation since 1934, now enables staff of all types and grades to share in the rewards for outstanding good work and careful maintenance of the permanent way.

Road Accidents in March, 1943.—The return issued by the Minister of War Transport of the number of persons reported to have died, or to have been injured, as a result of road accidents in Great Britain during the month of March last shows 529 deaths (compared with 550 in March, 1942), 2,435 seriously injured (compared with 2,894 in March, 1942), and 6,803 slightly injured (compared with 8,792 in March, 1942).

East Indian Railway Annuities.—Notice is given that on March 31, 1943, in accordance with the provisions of the East Indian Railway Purchase Act, 1879, a total sum of £8,622,676 was invested for the purpose of providing a sinking fund in respect of Annuities Class " B " ; and under the East Indian Railway Company Sinking Fund Act of 1892, the total sinking fund investments for Annuities Class " C " and for Annuities Class " D " were respectively £1,942,850 and £3,700,940.

Swedish Railway Nationalisation.—As from July 1 next, the Swedish State Railways are acquiring the undertakings of the Karlshamn-Vislanda-Bolmen Railway and the Hönshylte-Kvarnamåla Railway, both of Karlshamn. The former railway comprises 129 km. (80 miles), and the latter 21 km. (13 miles), each of 3 ft. 6 in. gauge. The two railways work in close association. The rolling stock of the K-V-B Railway is 11 steam locomotives, 25 carriages, 374 wagons, and 1 petrol railcar ; that of the H-K Railway is 1 locomotive, 2 carriages, and 14 wagons.

Brush Electrical Engineering Co. Ltd.—Net profit for the year 1942, after providing for general charges, debenture interest, maintenance, and reserve for depreciation and renewal of plant and for depreciation of buildings, war risks insurance, etc., amounts to £118,130 (£88,701), to which is added £6,601 brought forward, making £124,731 available for appropriation. The directors recommend appropriations of £4,572 for A.R.P., £4,074 for war damage insurance, £9,988 premium on redemption of debenture stock written off, £9,585 share issue expense written off, £25,000 provision for taxation, £25,000 transferred to general reserve, and £10,117 for preference dividends. The ordinary dividend proposed is 8 per cent., less tax, for the year, requiring £26,124, and leaving £10,271 to be carried forward.

Cost-of-Living Index.—The official cost-of-living index figure on April 1 was 98 points above the level of July, 1914. In April, 1938, it was 54 points, and in April, 1939, 53 points, above the level of July, 1914.

Tube Train Times.—The May issue of *The A.B.C. Railway Guide* includes the times of the first and last trains on the London tube railways ; details of the approximate frequency of services ; and particulars of interchange stations.

Bergslagernas Järvägar.—This is the largest privately-owned railway system in Sweden, and is one of the constituents of Trafikförvaltningen Göteborg - Dalarne-Gävle. Bergslagernas Järnvägar announces a net profit for 1942 of kr. 2,360,000, against kr. 2,320,000 for 1941. The dividend is unchanged at 5 per cent.

Postal Traffic Receipts.—The average daily receipts from postal traffic of the Post Office in the United Kingdom during the month of March amounted to £194,325, compared with £191,733 for February, and with £182,859 for March, 1942. The average daily receipts for the year 1942 were £194,232.

Public Works Loan for Uruguay.—According to information from Montevideo, a loan of $20,000,000 (U.S. currency), bearing interest at the rate of 4½ per cent. a year, has been negotiated successfully by the Uruguayan Government through the Import-Export Bank of the United States, to be spent on an extensive programme of public works, comprising a hydro-electrification scheme, an airport at Carrasco, docks, roads, and irrigation works. The hydro-electrification project, on the Rio Negro, is stated to be a modification, prepared by American experts, of a similar scheme the contract for which had been given to a German syndicate before the war, but which had to be abandoned. The loan was negotiated by the Uruguayan Minister for Foreign Affairs, Dr. Alberto Guani, during a recent visit to Washington.

Internal - Combustion Engine Research.—The British Internal Combustion Engine Research Association was registered on April 27 as a company limited by guarantee without share capital. The association includes the following companies : Ailsa Craig Limited ; W. H. Allen Sons & Co. Ltd. ; the Atlantic Engine Co. (1920) Ltd. ; Bamfords Limited ; Belliss & Morcom Limited ; Blackstone & Co. Ltd. ; Peter Brotherhood Limited ; the Brush Electrical Engineering Co. Ltd. ; Coventry Climax Engines Limited ; Coventry Diesel Engines Limited ; Crossley Bros. Ltd. ; Crossley-Premier Engines Limited ; Davey Paxman & Co. (Colchester) Ltd. ; the English Electric Co. Ltd. ; John Fowler & Co. (Leeds) Ltd. ; the General Electric Co. Ltd. ; Gleniffer Engines Limited ; R. A. Lister & Co. Ltd. ; Mirrlees, Bickerton & Day Limited ; the National Gas & Oil Engine Co. Ltd. ; F. Perkins Limited ; Petters Limited ; Robey & Co. Ltd. ; John Robson (Shipley) Limited ; Ruston & Hornsby Limited ; Stuart Turner & Co. (Surrey) Ltd. ; Tangyes Limited ; and J. & H. McLaren Limited.

Gävle-Dala Järnvägs.—This Swedish private railway company is one of the companies forming Trafikförvaltningen Göteborg-Dalarne-Gävle (with a total surplus for 1942 for distribution among the constituent companies of kr. 9,420,000, compared with kr. 9,260,000 for 1941) realised a net profit of kr. 1,410,000, compared with kr. 1,530,000 for 1941. The dividend is unchanged at 7 per cent. The group has started electrification work on the line between Gävle and Falun, a distance of about 57 miles. The total cost of this electrification work is estimated at kr. 4,550,000, and an additional amount of kr. 2,890,000 will be required for the purchase of electric locomotives. To help to finance the work, a 3½ per cent. loan of kr. 6,000,000 is to be raised.

Contracts and Tenders

The following orders have been placed recently by the Egyptian State Railways :—

Tubes Limited : Tubes and brushes.
Superheater Co. Ltd. : Clamp bolts and washers.
Taylor Bros. & Co., Ltd. : Locomotive spares.
Morgan Crucible Co. Ltd. : Carbon and bronskol brushes.
Standard Oil Company : Oil.

Swedish Orders from Germany

The fact that 230 wagons were ordered in Germany by the Swedish State Railways in the course of 1942 has caused the Swedish railway industry to raise complaints which seem the more justified as its capacity was far from being used by either the State or the privately-owned railways. In its reply, the Swedish State Railways administration stressed the fact that it naturally preferred to place orders with the Swedish industry, but that considerations of international policy, in addition to the necessity of equalising the very uneven clearing position between Sweden and Germany, had been responsible for the preference given to Germany. In this connection it was pointed out that, of 7,887 vehicles ordered by the Swedish railways in the past ten years, 7,487 were ordered from the Swedish industry. The Swedish State Railways envisage placing orders for 800 wagons in the course of 1943, all of which will go to the Swedish industry ; this total is far below its actual capacity.

Railway Stock Market

After a buoyant trend in Stock Exchange markets in response to the war news from Tunisia, the volume of business in most sections failed to show further improvement, and earlier gains in security values were not fully held. The tendency has been for markets to centre attention mainly on securities which are favoured on hopeful views as to their post-war prospects, and in this connection, French railway bonds showed good response to improved demand. Home railway securities were less prominent, but nevertheless, only a small part of recent gains in the junior stocks has not been held. The rather lower prices made by prior charges and senior preference issues were again attributed to the prevailing tendency in long-dated gilt-edged stocks. A good feature was provided by renewed demand for South American railway stocks, sentiment as to which was assisted by the improved exchange position, and also by the view that when the war is over there will be large demand for South American products, particularly in connection with food supplies for Europe. Current trends in security values should, of course, be read in relation to the invariable tendency for Stock Exchange markets to attempt to discount the future a very long way ahead. In fact, for a considerable period, stocks of the Argentine railways have been firmly held because of general willingness to be prepared to take a long view, despite the probability that some time will have to elapse before the preference and ordinary stocks return to the dividend list. The assumption appears to prevail in the market that, owing to uncertainty as to the eventual plans for organising transport, the post-war prospects of home railway stocks are very difficult to define at this stage. Nevertheless, there is every reason to expect that, in any development of this kind, the railways and their stockholders will receive fair and equitable treatment. In fact, there seem good grounds for the view that from the angle of the good yields obtainable, and also on long-term considerations, home railway stocks can reasonably be considered as very moderately valued. As pointed out in these notes on various occasions, dividends around current rates may rule for a considerable period. This assumption turns on the fact that the existing rental agreement is to remain in force until at least one year after the termination of hostilities, which probably implies until Japan as well as Germany has been defeated. Moreover, it is not improbable, according to some views, that the agreement may operate until there is a final decision on the post-war organisation of transport.

In accordance with the general tendency in home railway stocks, Great Western ordinary has not held best prices recorded recently; nevertheless at 64⅜ the price was unchanged on balance for the week. Great Western 5 per cent. preference, however, moved down from 118½ to 117, and the 4 per cent. debentures were fractionally lower at 114. L.M.S.R. ordinary was 34⅜, compared with 34½ a week ago, the 1923 preference 64½, compared with 66, and the senior preference 78, compared with 79½. L.M.S.R. guaranteed stock remained at 103. There was again a fair amount of activity in L.N.E.R. deferred and preferred, which, however, reflected profit-taking. L.N.E.R. second preference reacted from 36¼ to 35⅜ and the first preference from 65½ to 64. L.N.E.R. first guaranteed was 99 and the second guaranteed 92. Among Southern issues the deferred at 25⅞ was fractionally lower on balance, as was the preferred at 79¼; the 5 per cent. preference was 116. Despite their recent rise, there has been no heavy selling of home railway junior stocks, current yields being considered as attractive. London Transport "C" was fractionally higher at 64½, compared with 64¼ a week ago.

Among the general rise in Argentine railway stocks, B.A. Gt. Southern 4 per cent. debentures were 64, B.A. & Pacific 4½ per cents 55, B.A. Western 4 per cents 60, and Central Argentine 4 per cents 49. Elsewhere, Leopoldina debentures were 59. San Paulo ordinary further improved to 69 awaiting the dividend announcement. Canadian Pacifics were inclined to ease.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week Ending	Traffic for Week: Total this year	Traffic for Week: Inc. or Dec. compared with 1941/2	No. of Weeks	Aggregate Traffics to date: Totals 1942/3	Aggregate Traffics to date: Totals 1941/2	Aggregate Traffics to date: Increase or Decrease	Shares or Stock	Prices: Highest 1942	Prices: Lowest 1942	Prices: May 7 1943	Prices: Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	2.5.43	27,530	+ 4,050	18	474,020	377,400	+ 96,620	Ord. Stk.	14	7⅞	14	Nil
	Argentine North Eastern ...	753	1.5.43	13,674	+ 1,578	44	539,106	465,438	+ 73,668	..	6½	3	6	Nil
	Bolivar	174	Apr., 1943	5,550	+ 1,220	16	21,881	18,458	+ 3,423	6 p.c. Deb.	19½	10	19½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	20⅛	9	22	Nil
	Buenos Ayres & Pacific ...	2,807	1.5.43	110,100	+ 9,900	44	4,402,140	3,828,060	+ 574,030	Ord. Stk.	7⅜	4	6½	Nil
	Buenos Ayres Great Southern	5,080	1.5.43	148,020	+ 6,480	44	7,101,600	6,453,930	+ 674,700	Ord. Stk.	12½	7⅛	13	Nil
	Buenos Ayres Western ...	1,930	1.5.43	60,660	+ 17,100	44	2,377,740	2,247,060	+ 130,680	..	12⅝	6	13	Nil
	Central Argentine	3,700	1.5.43	120,912	+ 17,862	44	5,820,951	4,622,823	+ 1,198,128	..	9½	4¼	9	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	3½	2½	4½	Nil
	Cent. Uruguay of M. Video...	972	24.4.43	35,755	+ 6,875	43	1,220,095	1,074,464	+ 145,631	Ord. Stk.	8	4	6¾	Nil
	Costa Rica	262	Feb., 1943	17,896	— 3,118	35	114,452	180,476	— 66,024	Stk.	16½	11	15	Nil
	Dorada	70	Jan., 1943	6,000	+ 3,530	4	—	—	—	1 Mt. Db.	90½	89	92½	6½
	Entre Rios	808	1.5.43	17,250	+ 2,202	44	775,380	677,034	+ 98,316	Ord. Stk.	33	4½	7	Nil
	Great Western of Brazil ...	1,030	1.5.43	14,400	+ 6,200	17	281,200	188,700	+ 92,500	Ord. Sh.	9/-	9/-	40/-	Nil
	International of Cl. Amer. ...	794	Jan., 1943	$655,799	— $5,506	4	$655,799	$661,305	— $5,506	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	1⅛	5/3	2	Nil
	La Guaira & Caracas... ...	22½	Apr., 1943	8,440	+ 2,132	16	35,875	26,170	+ 9,705	5 p.c. Deb.	11½	5	82½	Nil
	Leopoldina	1,918	1.5.43	34,755	+ 4,052	17	564,327	523,550	+ 40,777	Ord. Stk.	6¾	3⅛	6½	Nil
	Mexican	483	30.4.43	ps. 712,300	+ ps. 194,100	16	ps. 6,224,400	ps. 6,034,800	+ ps. 189,600	Ord. Stk.	1	⅛	1½	Nil
	Midland Uruguay	319	Mar., 1943	18,039	+ 2,103	36	134,739	123,127	+ 11,612	—	—	—	—	—
	Nitrate	382	30.4.43	7,957	+ 2,576	15	50,015	47,086	+ 2,929	Ord. Sh.	77/	3½	81/3	Nil
	Paraguay Central	274	30.4.43	$5,559,000	+ $1,467,000	44	$176,666,000	$155,725,000	+ $20,941,000	Pr. Li. Stk.	53	40	52½	11⅛
	Peruvian Corporation ...	1,059	Apr., 1943	89,811	+ 9,084	40	847,392	752,443	+ 94,949	Pref.	19⅞	5½	16½	Nil
	Salvador	100	Jan., 1942	c 177,000	+ c 39,000	30	c 757,000	c 499,172	+ c 109,828	—	—	—	—	—
	San Paulo	153½	25.4.43	35,233	— 172	17	600,058	583,711	+ 16,374	Ord. Stk.	59	41	67	2⅛
	Taltal	160	Mar., 1943	4,435	+ 535	17	41,346	39,015	+ 2,331	Ord. Sh.	41/-	23/-	32/6	Nil
	United of Havana	1,346	2.5.43	68,299	+ 7,436	44	2,244,325	1,345,699	+ 898,626	Ord. Stk.	8½	2½	6½	Nil
	Uruguay Northern	73	Mar., 1943	1,595	+ 461	39	12,659	11,090	+ 1,559	—	—	—	—	—
Canada	Canadian Pacific	17,039	30.4.43	1,591,600	+ 223,600	14	17,465,800	15,653,200	+ 1,812,600	Ord. Stk.	16¾	9⅞	16¼	Nil
India†	Barsi Light	202	Jan., 1943	22,440	+ 10,612	42	172,958	135,863	+ 37,095	—	—	—	—	—
	Bengal & North Western ...	2,090	Nov., 1942	264,975	— 33,087	8	449,400	561,082	— 111,682	—	—	—	—	—
	Bengal-Nagpur	3,267	Feb., 1943	932,775	+ 84,975	46	10,031,400	9,111,000	+ 920,400	Ord. Stk.	102½	88	103½	3⅞
	Madras & Southern Mahratta	2,939	10.1.43	242,475	+ 33,202	38	6,658,391	5,656,721	+ 1,000,167	..	105½	87	108¼	5½
	Rohilkund & Kumaon ...	571	Nov., 1942	555,750	+ 5,072	8	115,950	99,909	+ 16,041	—	—	—	—	—
	South Indian	2,402	10.1.43	166,555	+ 778	39	4,928,736	4,148,309	+ 780,427	..	103¾	88⅞	102⅛	4⅞
Various	Egyptian Delta	607	20.1.43	14,821	— 2,325	43	373,655	272,885	+ 100,770	Prf. Sh.	5⅛	1⅛	4	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	44	35	36	9⅜
	Midland of W. Australia ...	277	Feb., 1943	27,341	+ 9,886	32	252,708	158,894	+ 93,814	Inc. Deb.	95	90	98	6⅛
	Nigerian	1,900	26.12.42	91,754	+ 35,534	38	2,570,963	2,112,188	+ 458,775	—	—	—	—	—
	South Africa	13,291	27.3.43	849,853	+ 28,222	51	40,899,395	39,811,466	+ 1,087,929	—	—	—	—	—
	Victoria	4,774	Nov., 1942	1,407,419	— 227,886	—	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ⅛

† Receipts are calculated @ 1s. 6d. to the rupee

Argentine traffics are given in sterling calculated @ 16⅔ pesos to the £

§ ex dividend